

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

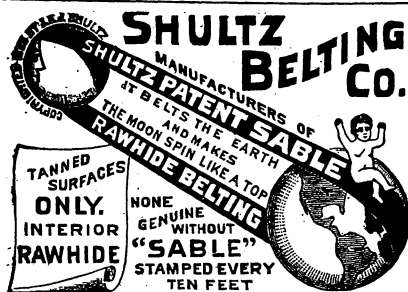
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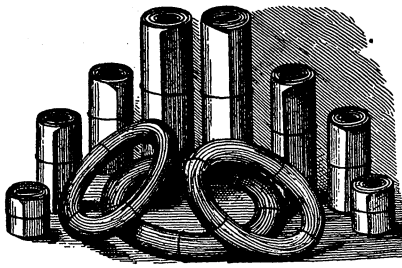
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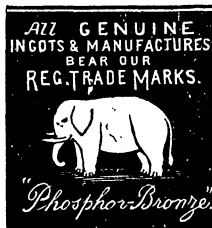
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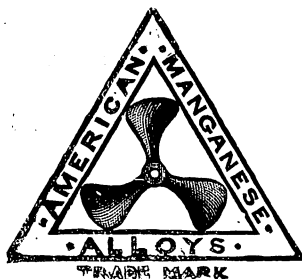
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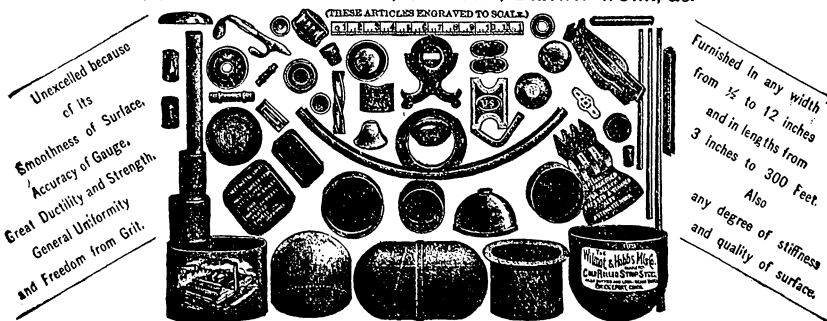
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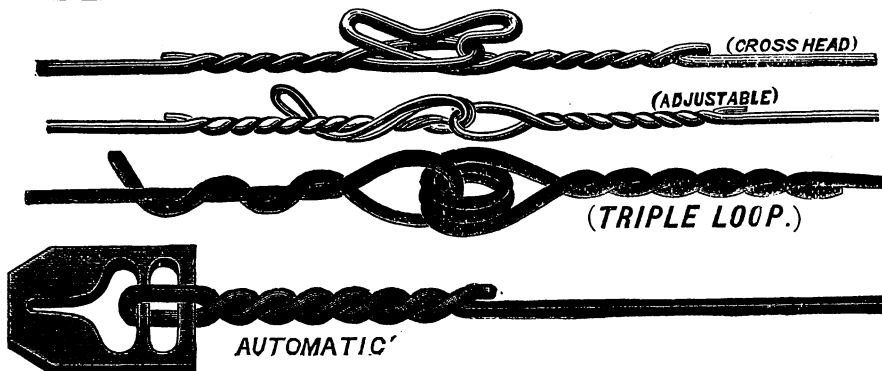
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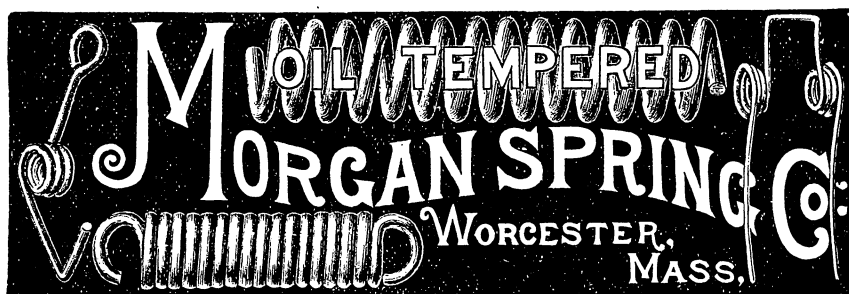


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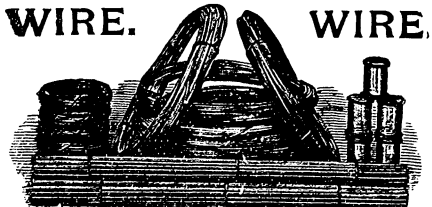
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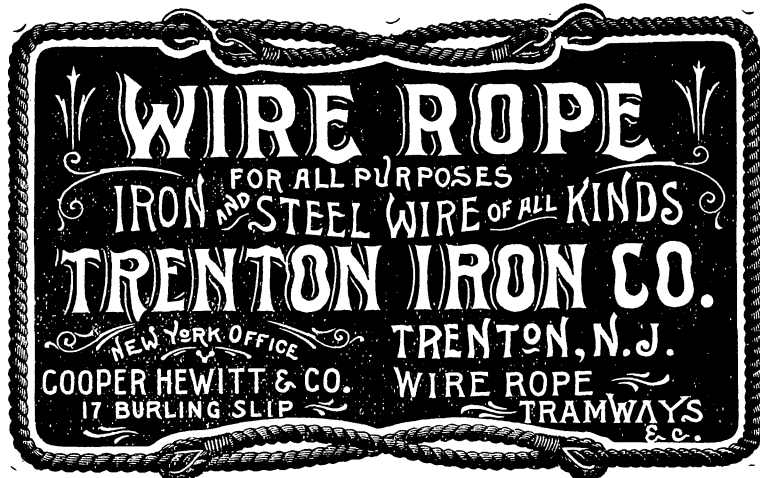
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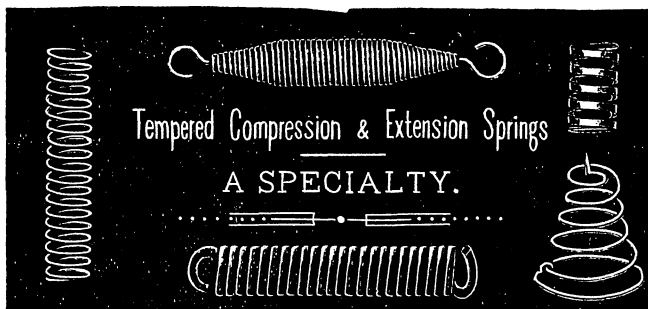
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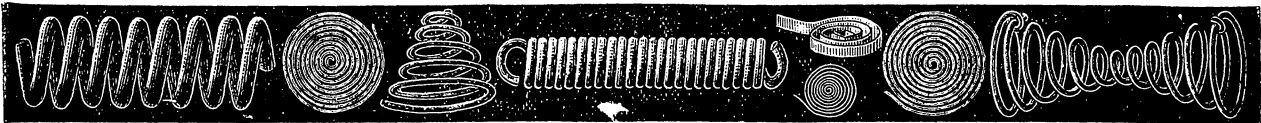
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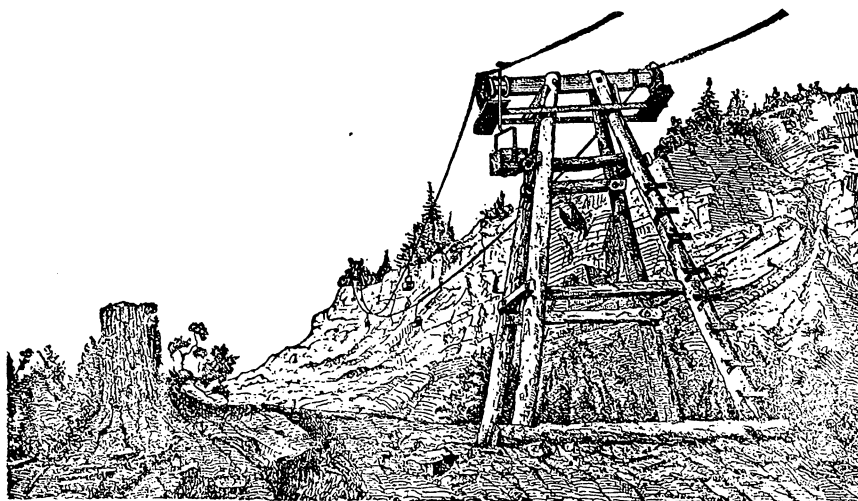
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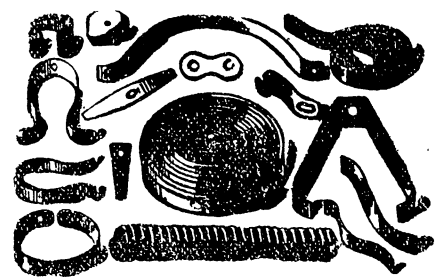
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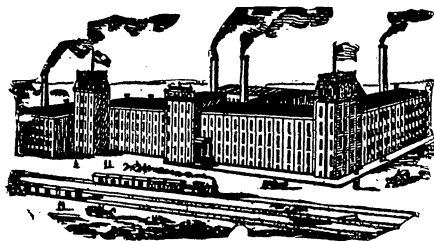
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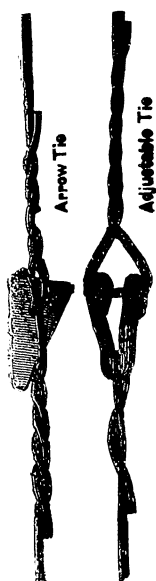
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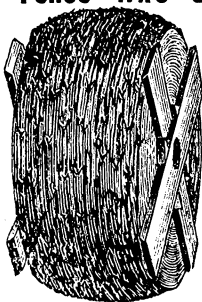
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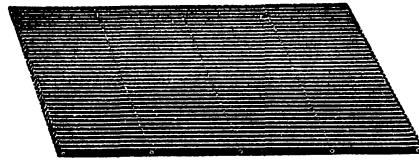
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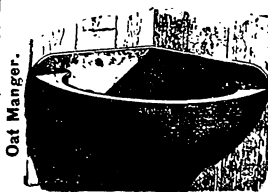
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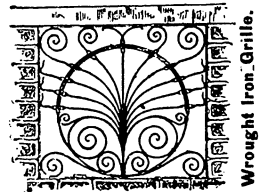


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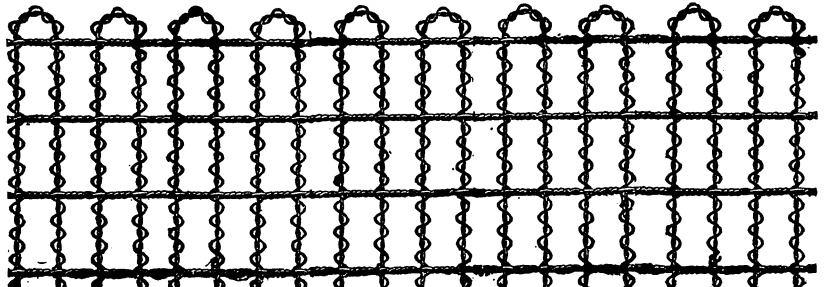
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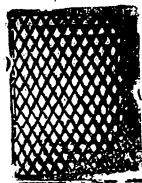


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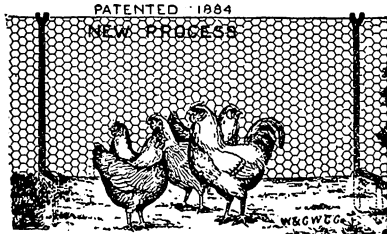
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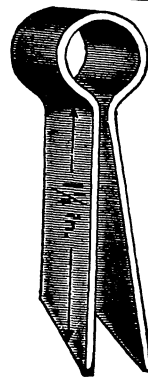
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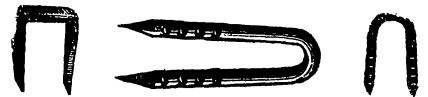


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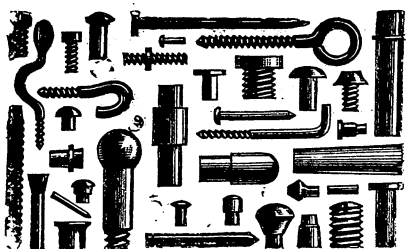
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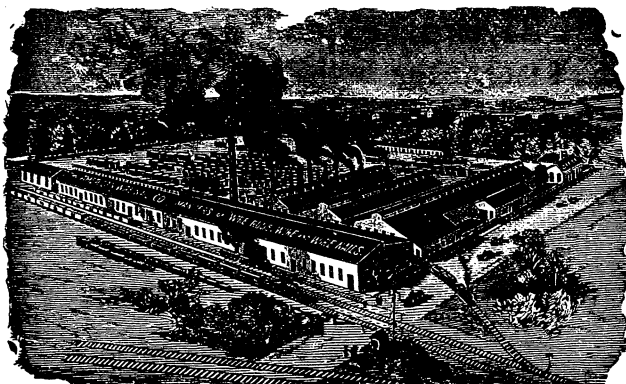
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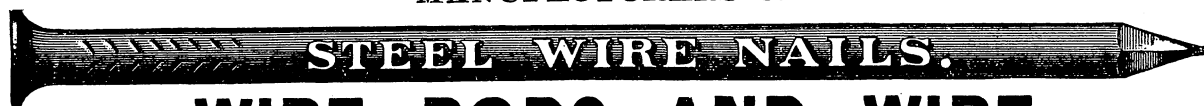
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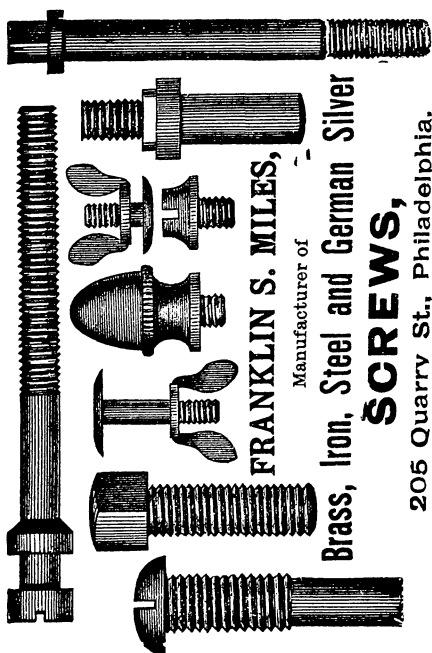
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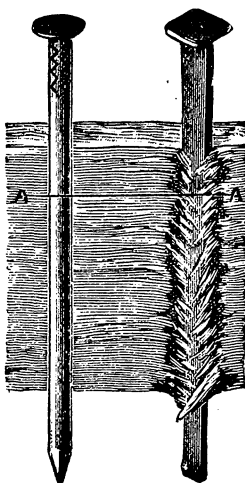
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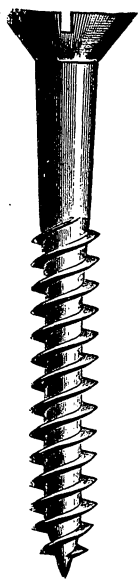
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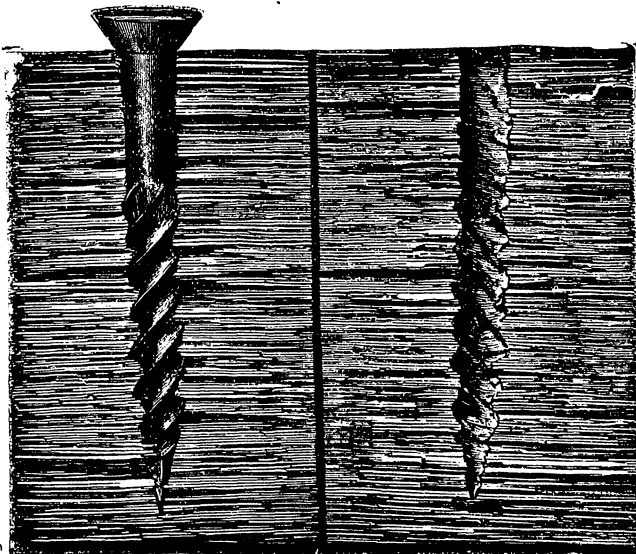
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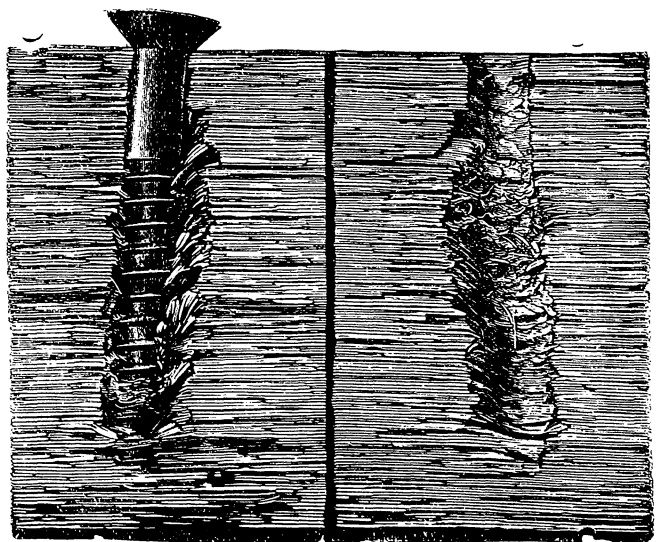
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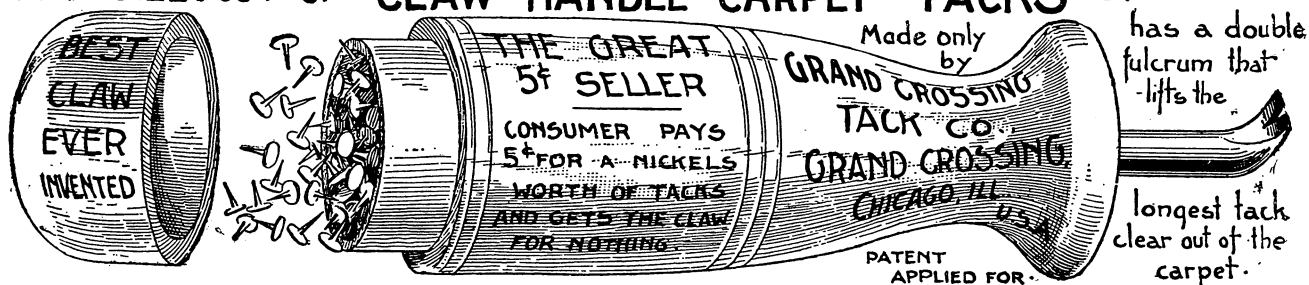
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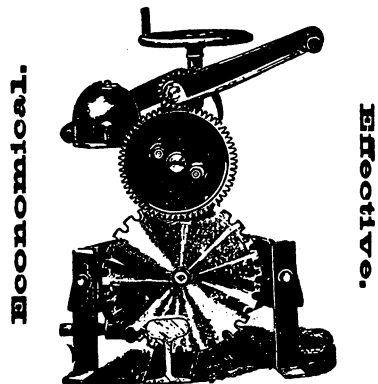
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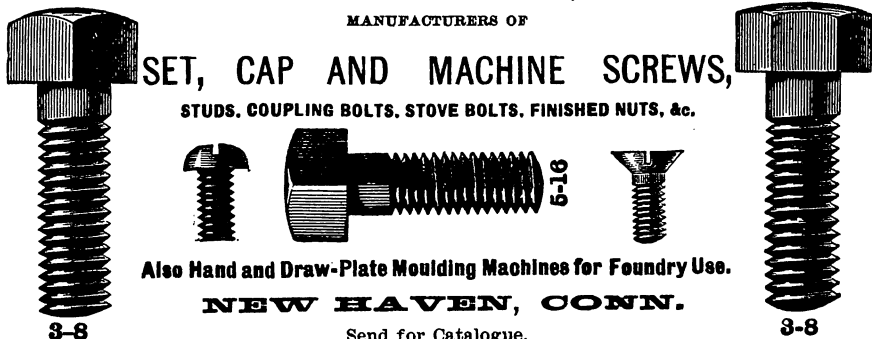
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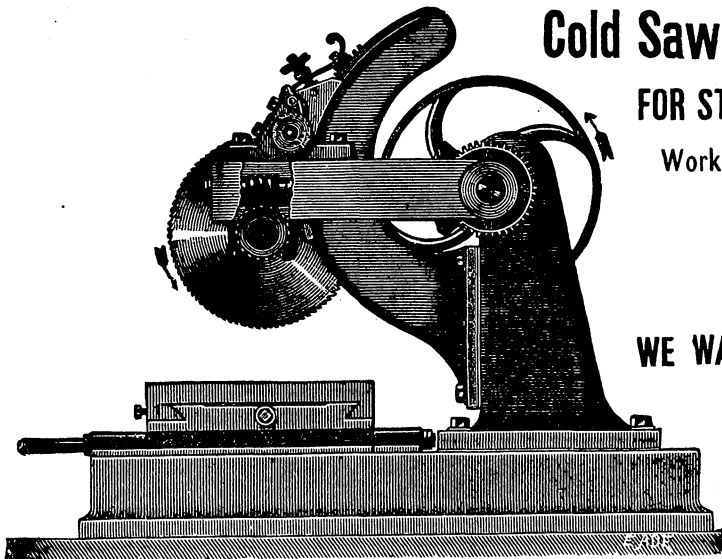
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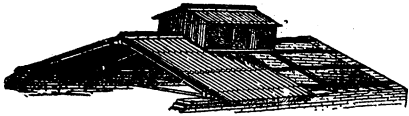
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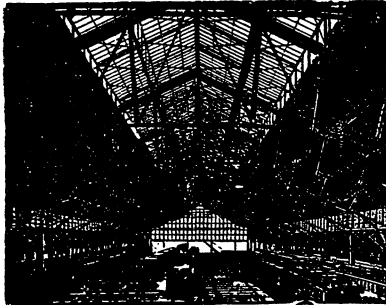
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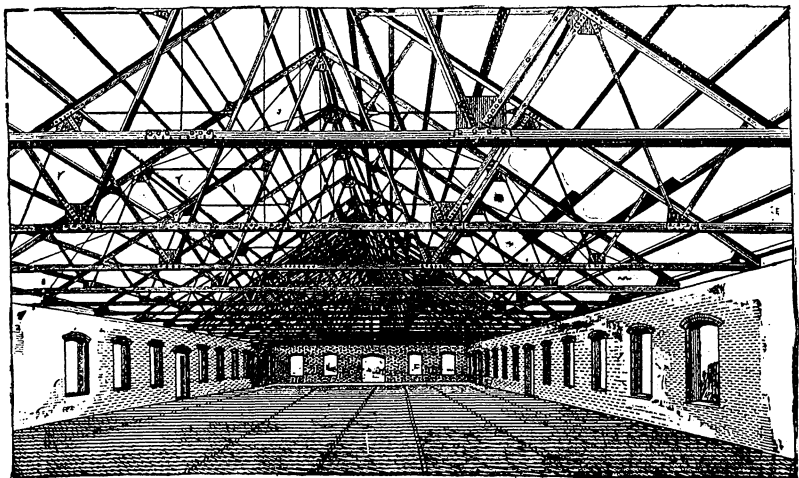
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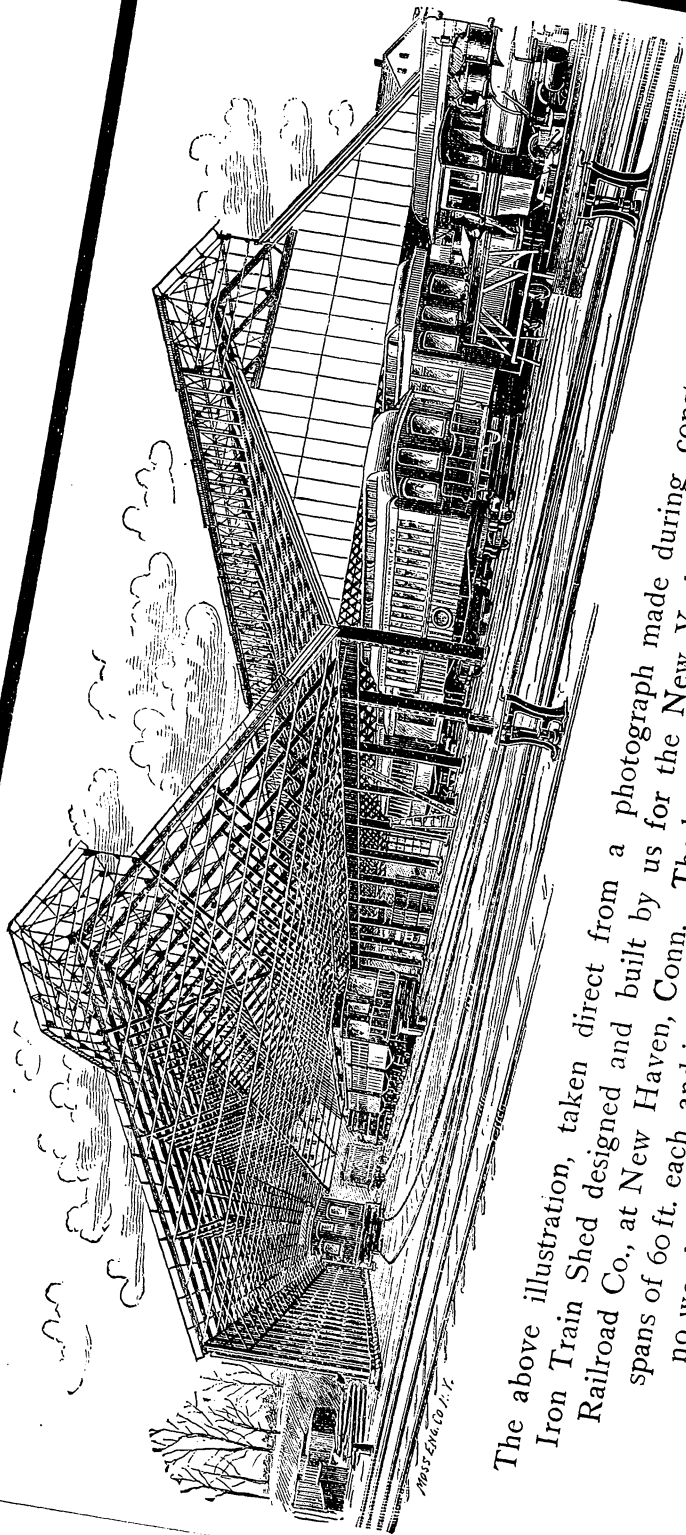
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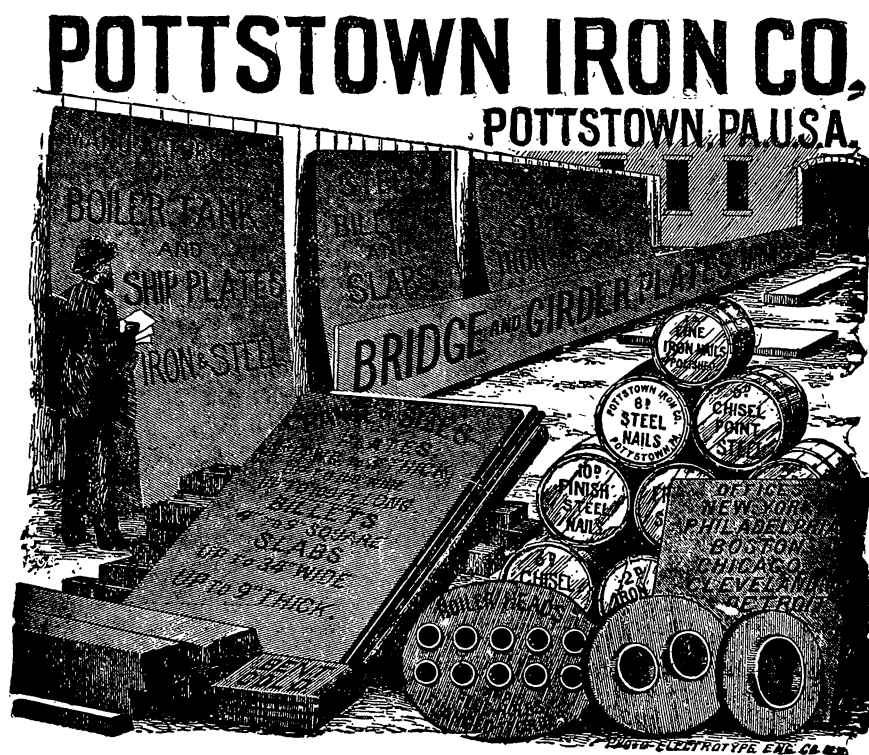
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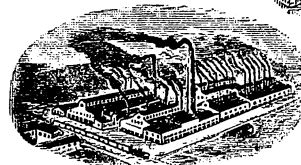
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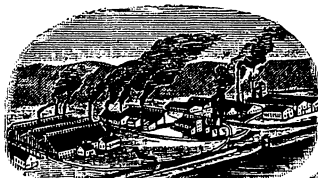
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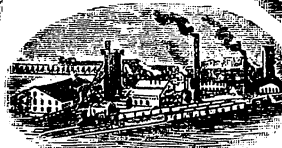
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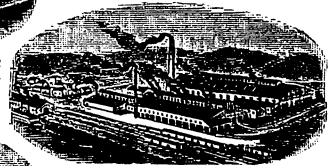
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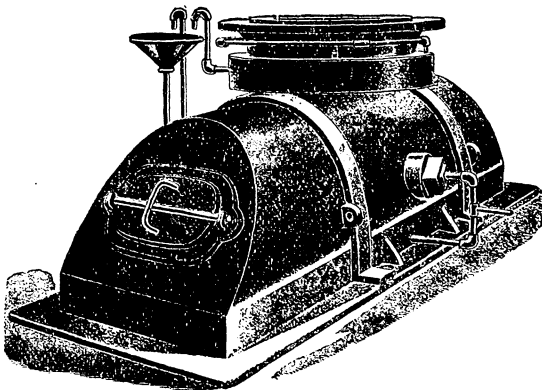
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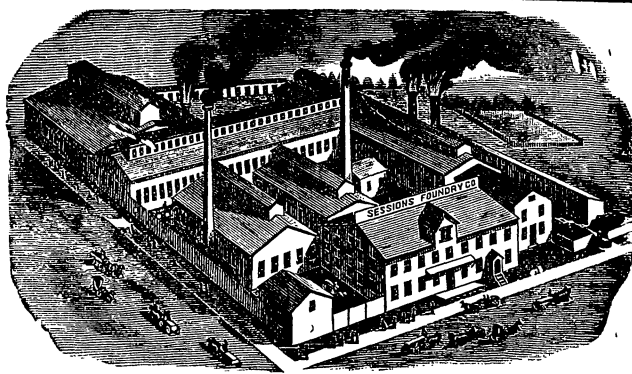
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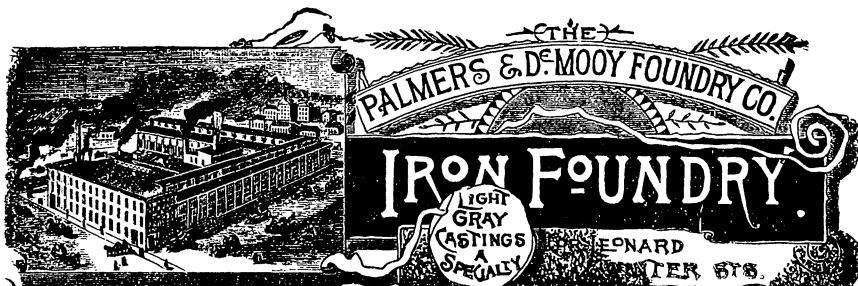
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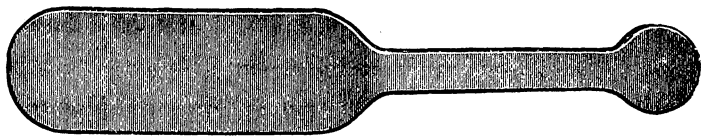
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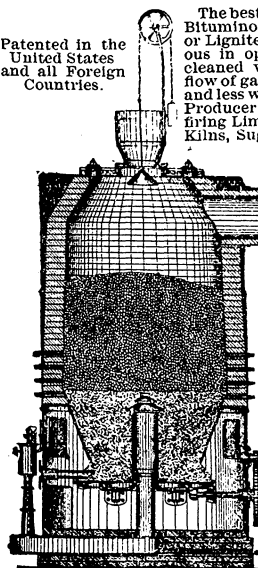
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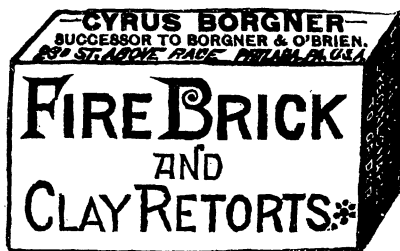
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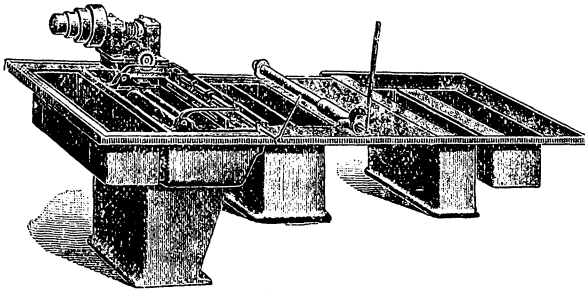
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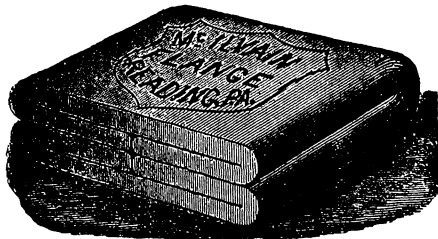
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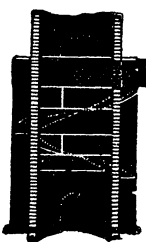
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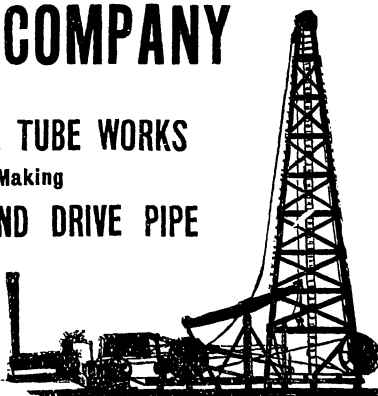
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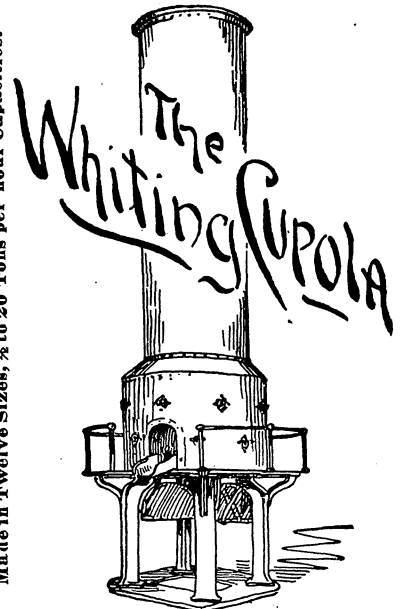
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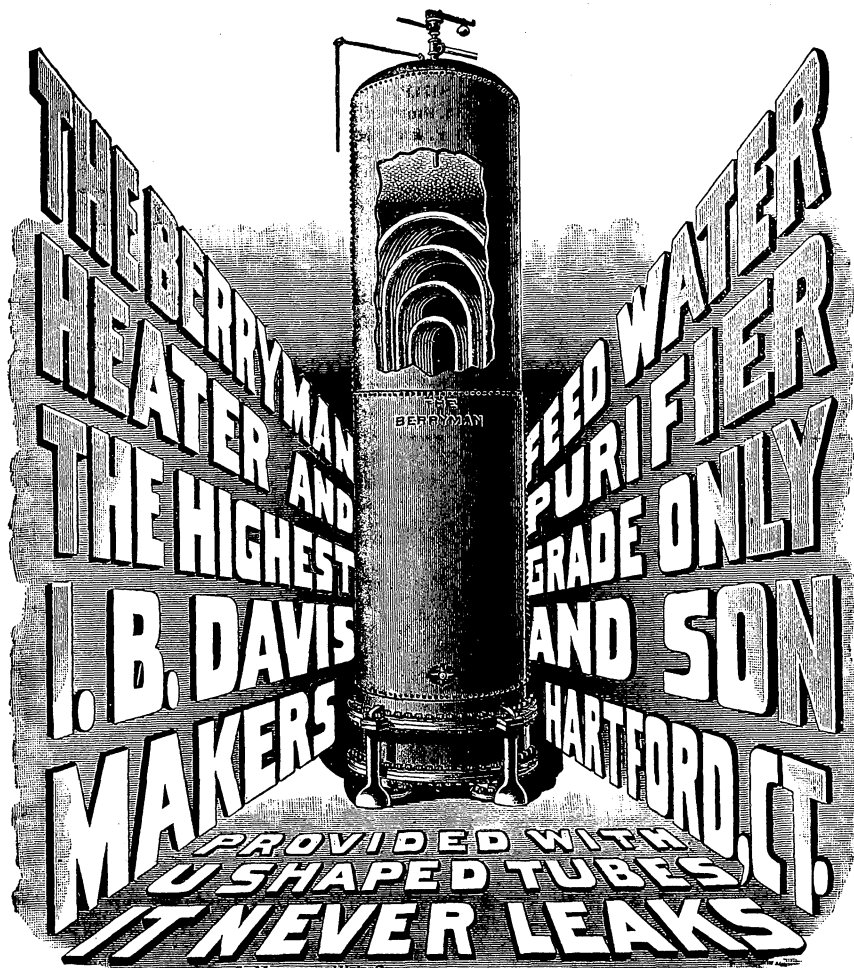
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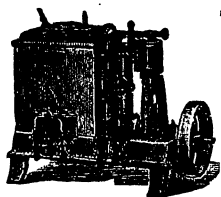
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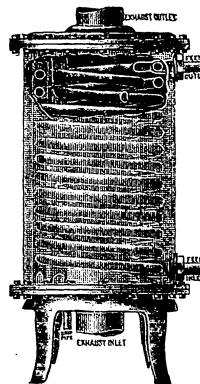
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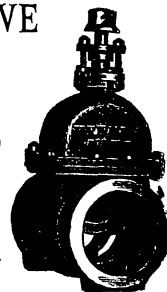
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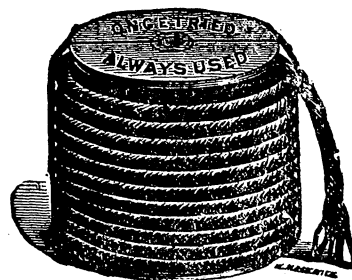
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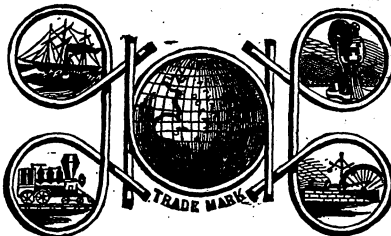
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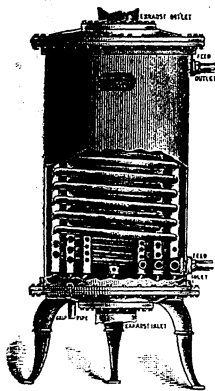


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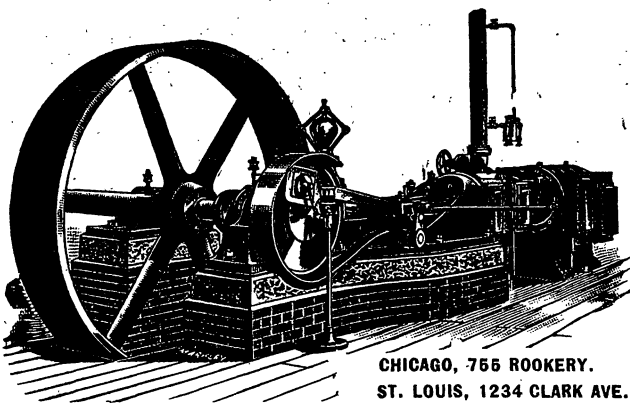
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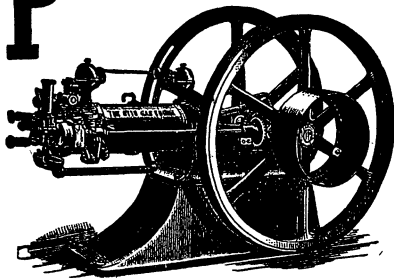
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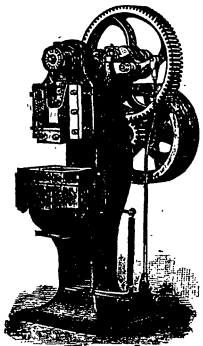
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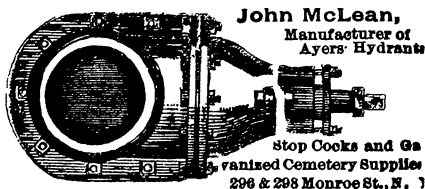
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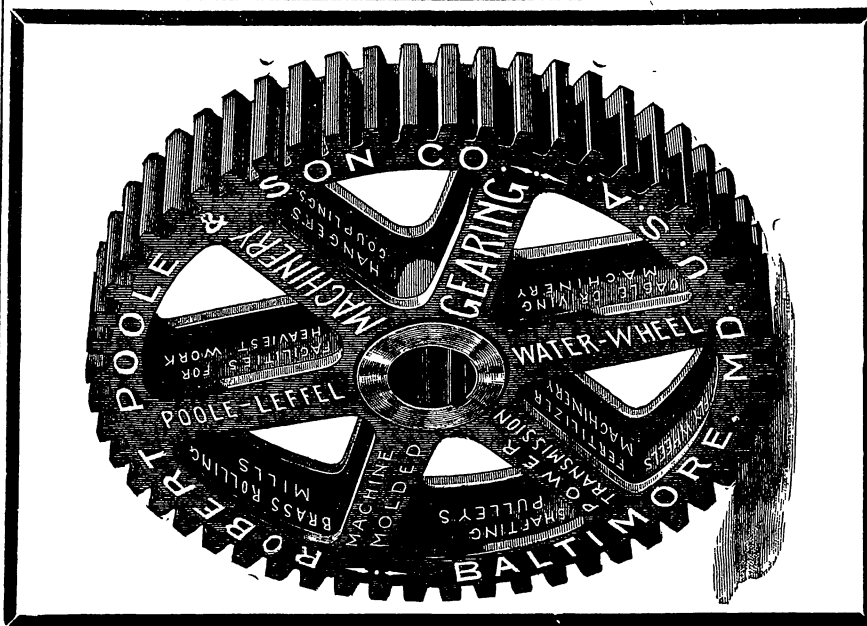
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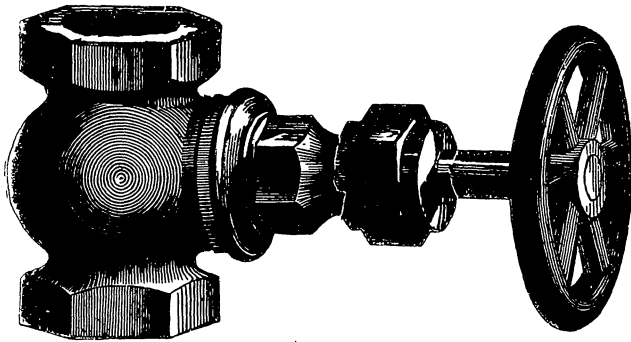
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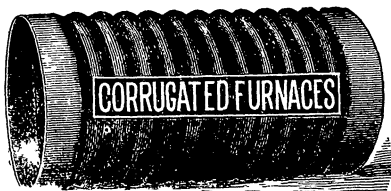
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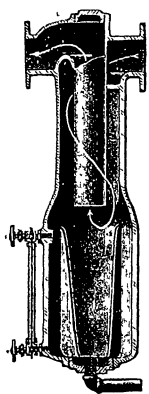
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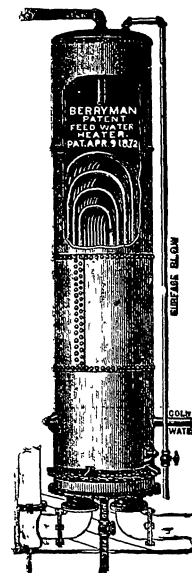
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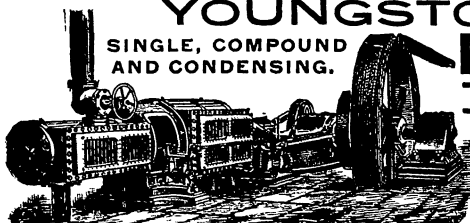
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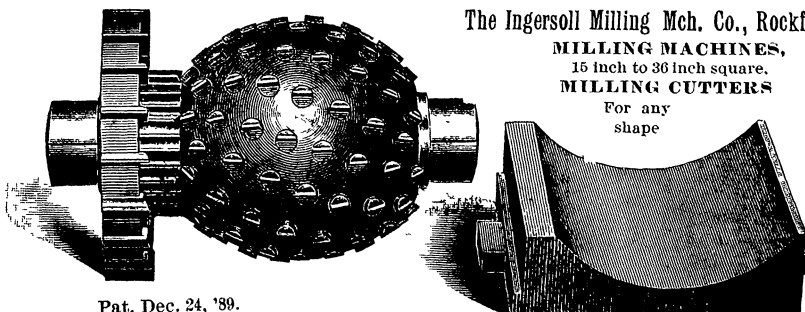
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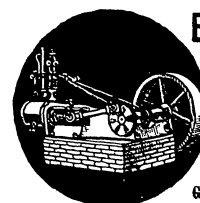
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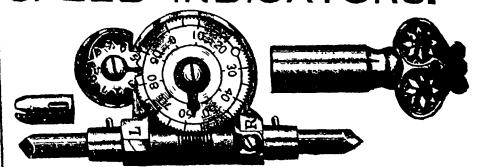
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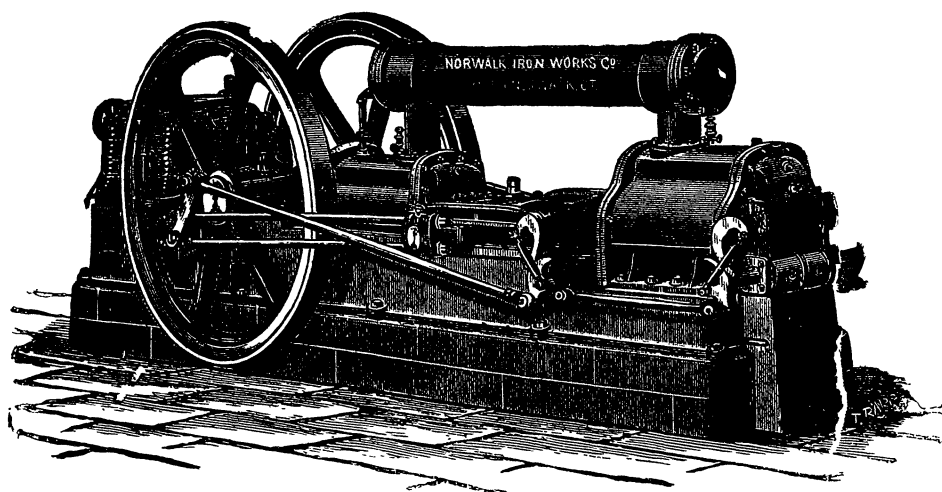
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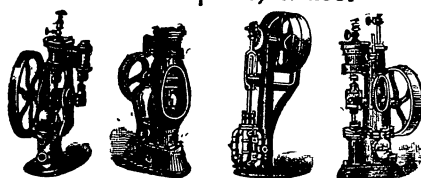


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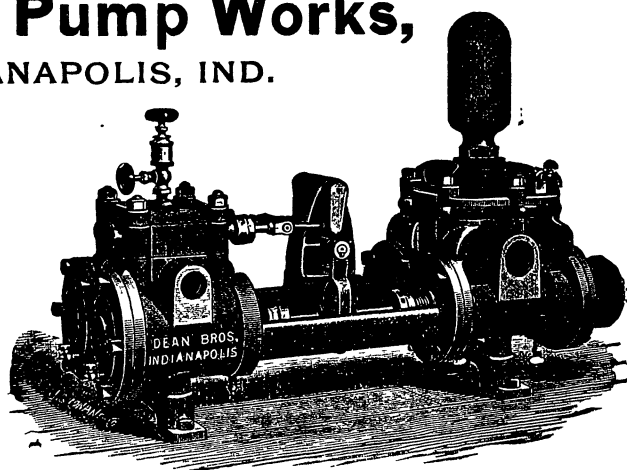
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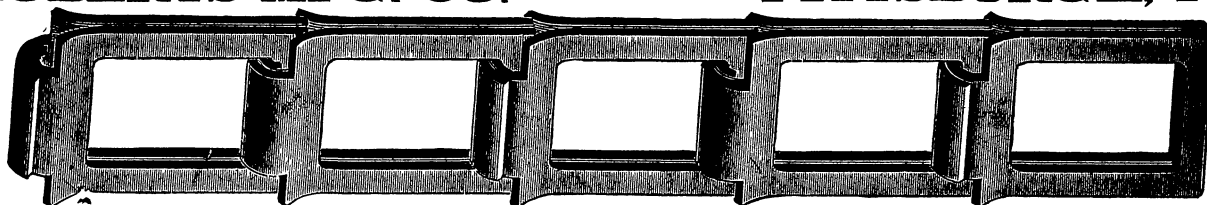
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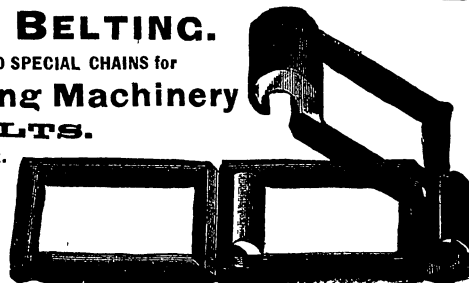
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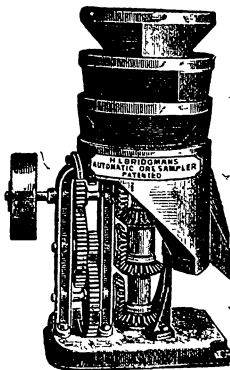
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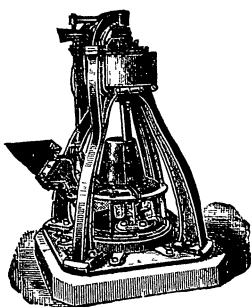
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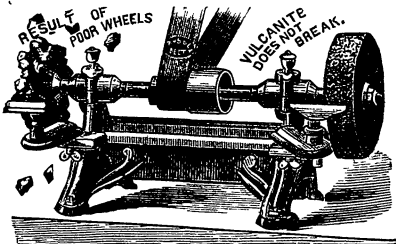


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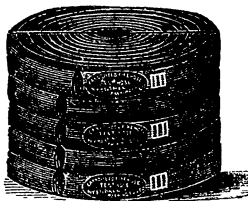
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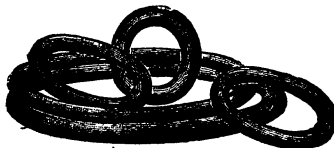
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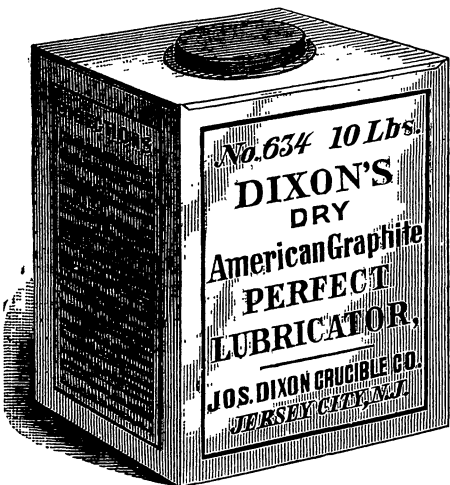
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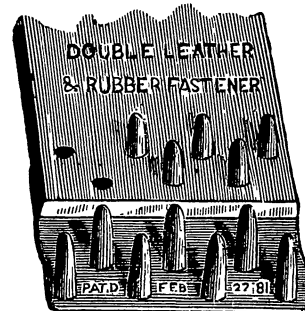
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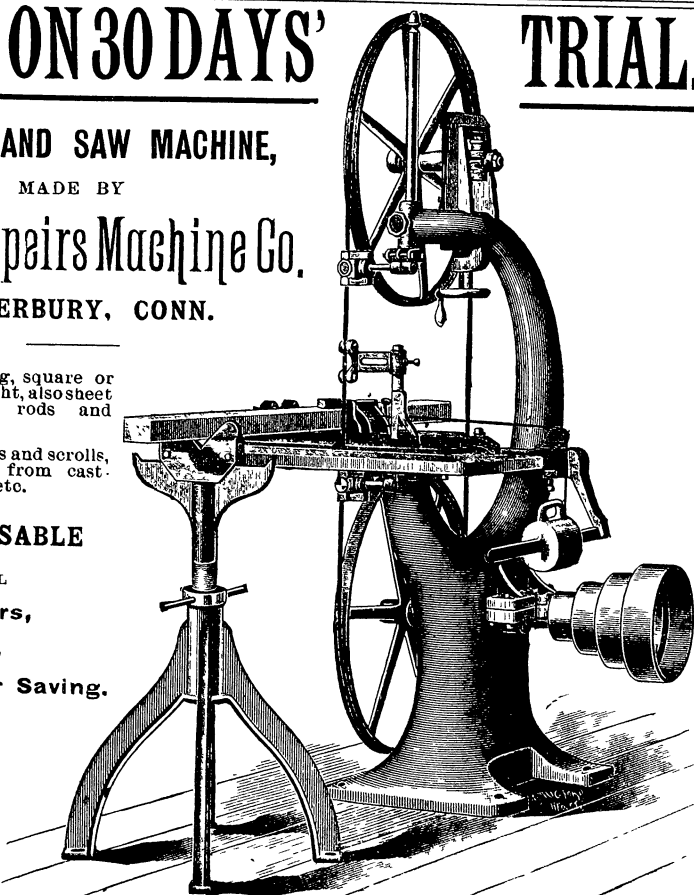
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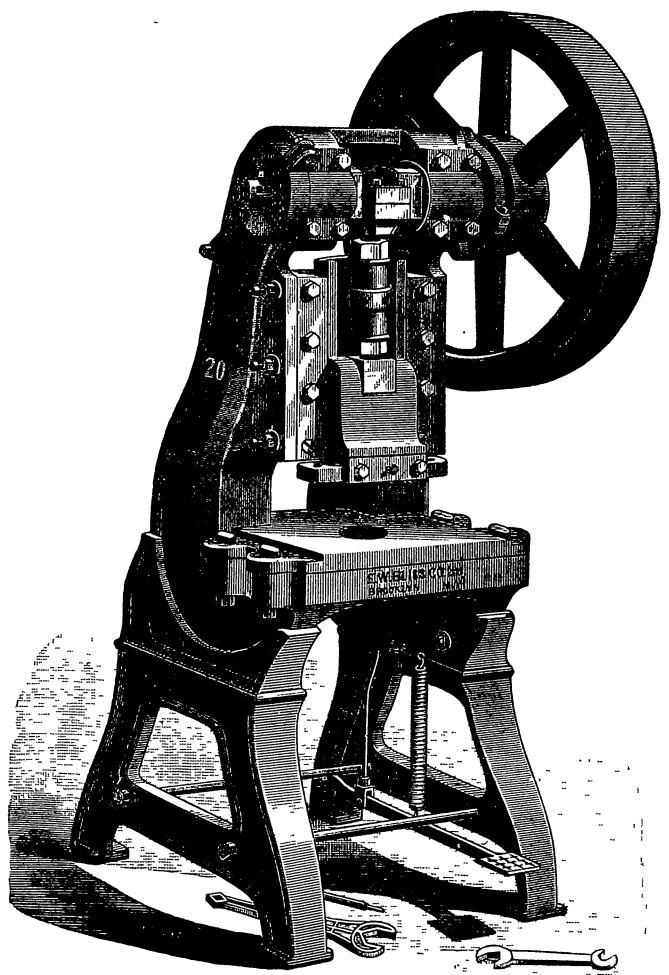
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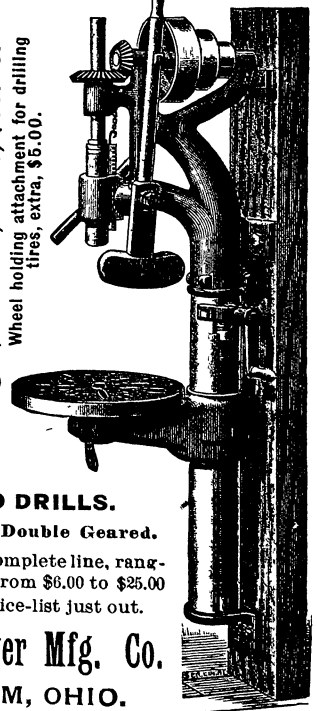
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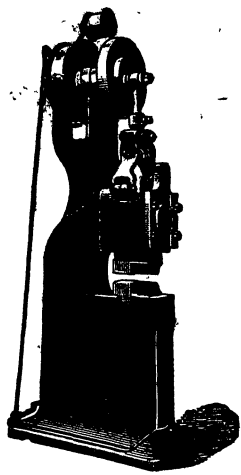
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The entire working parts of the Hammer are at the top, in full view of the operator, and every part is readily accessible, being easily operated by inexperienced men.

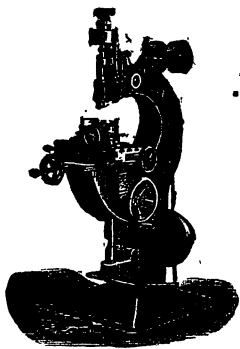
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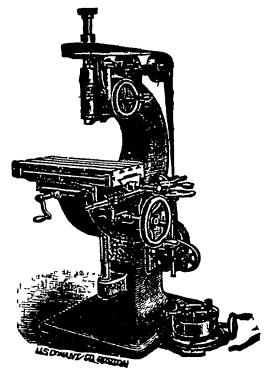
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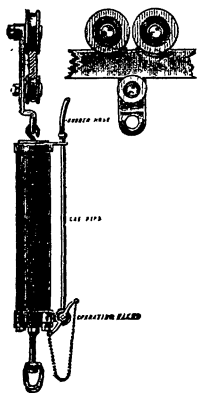
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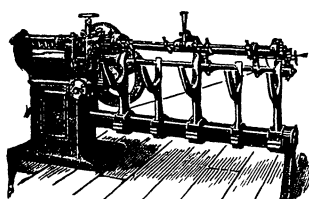


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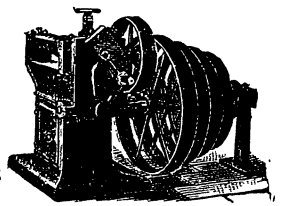
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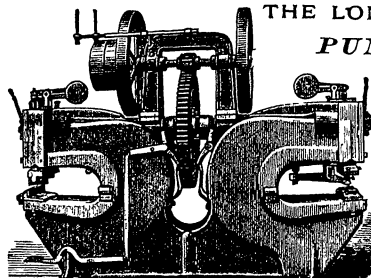
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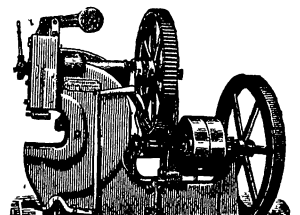


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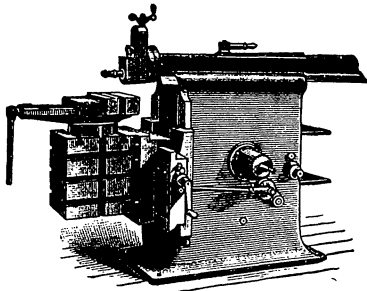
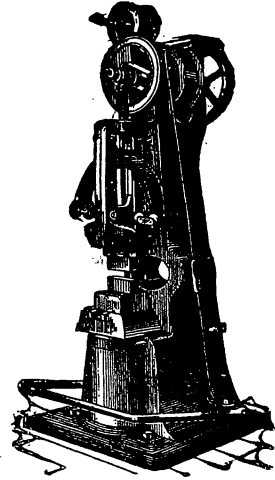
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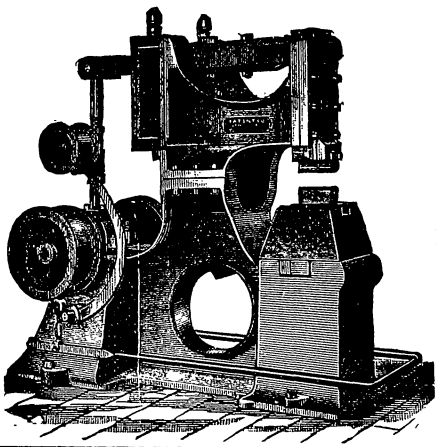
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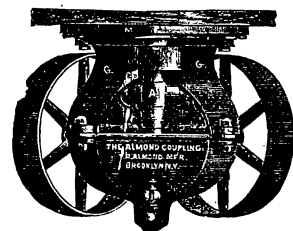
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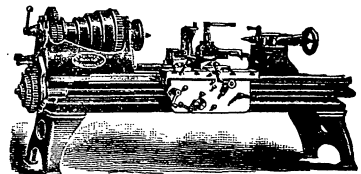


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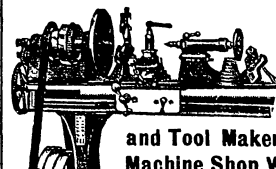


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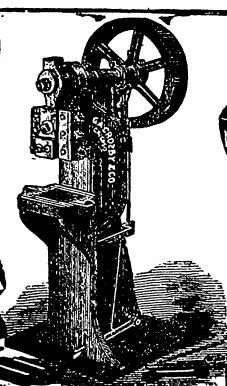
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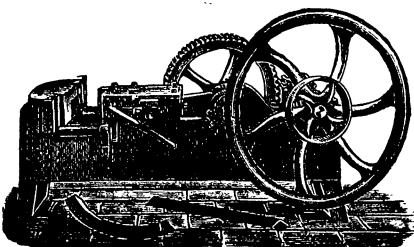
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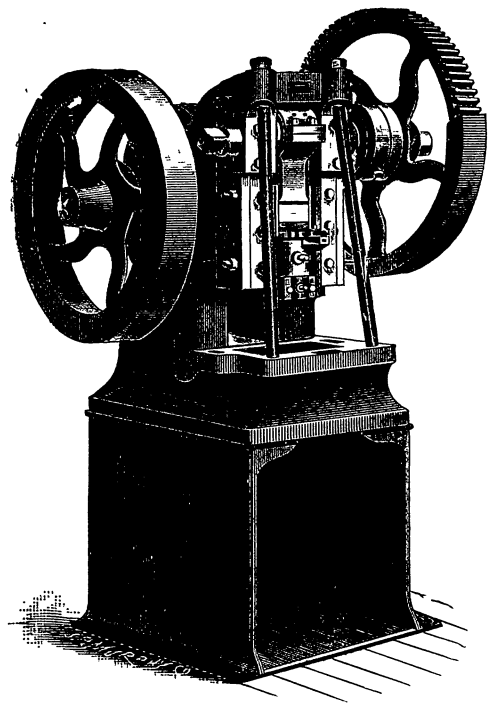
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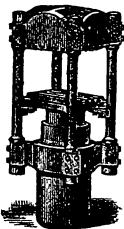
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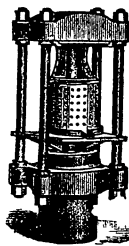
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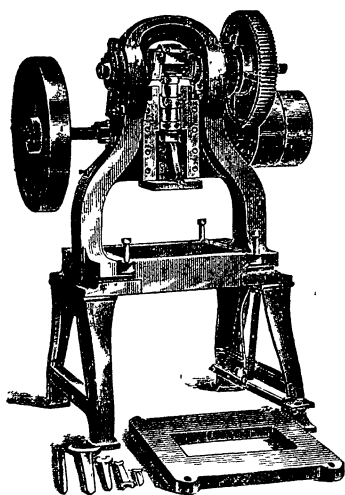
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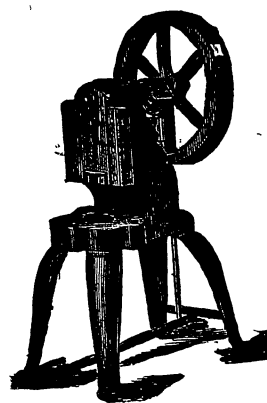


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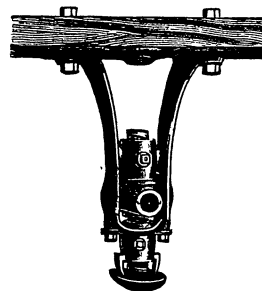
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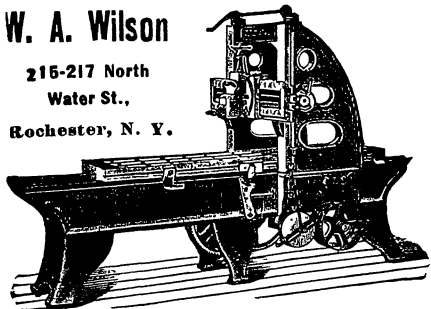


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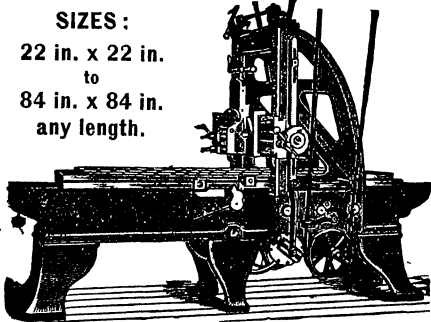


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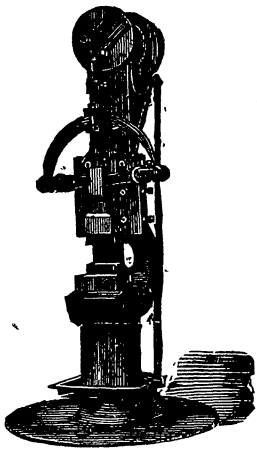
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to
84 in. x 84 in.
any length.



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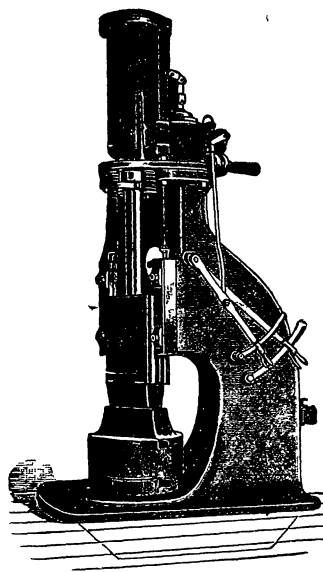


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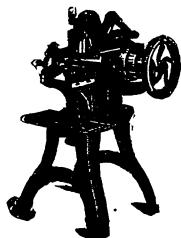
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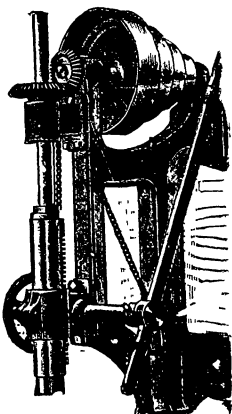
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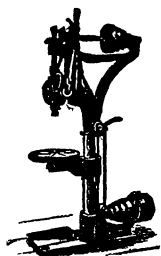
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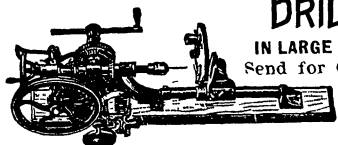
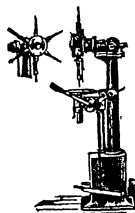
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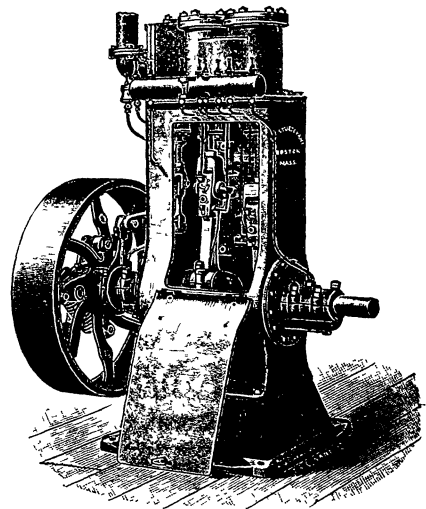
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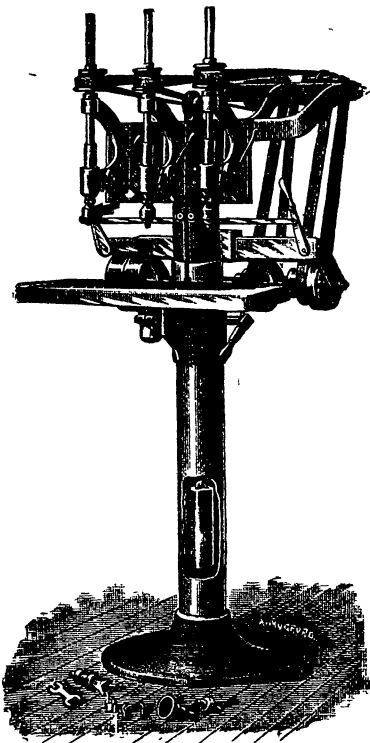
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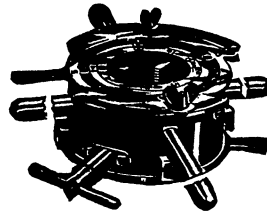
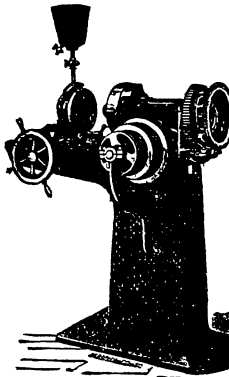
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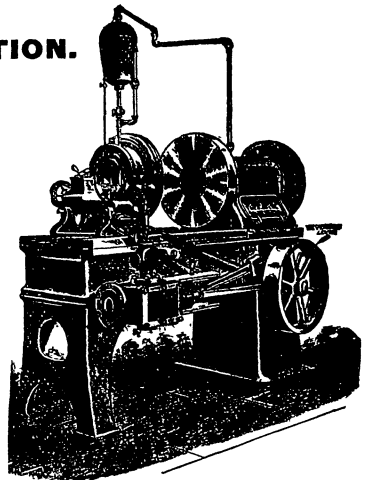
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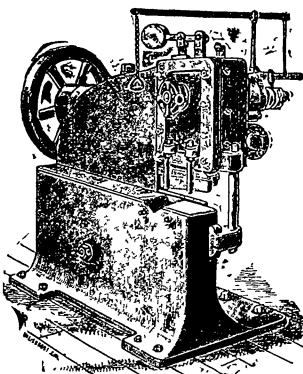
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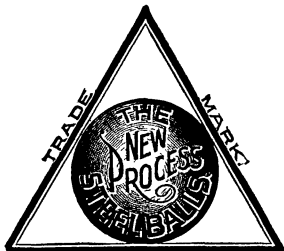
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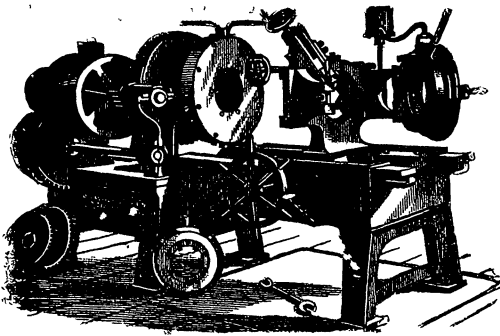
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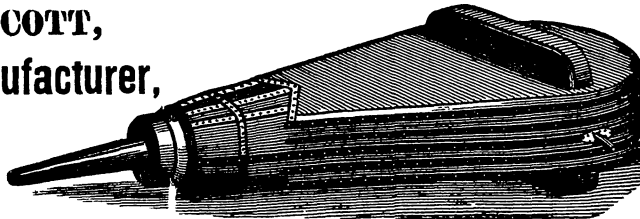
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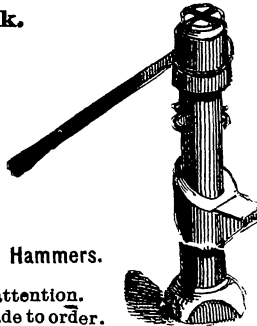
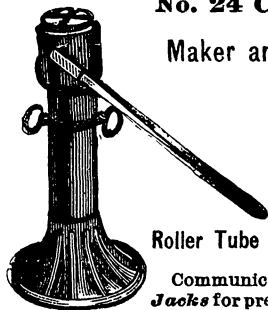


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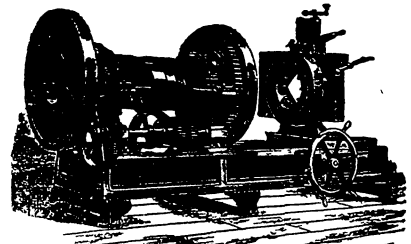
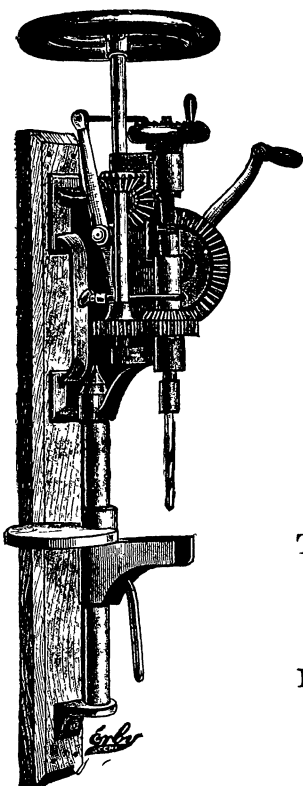
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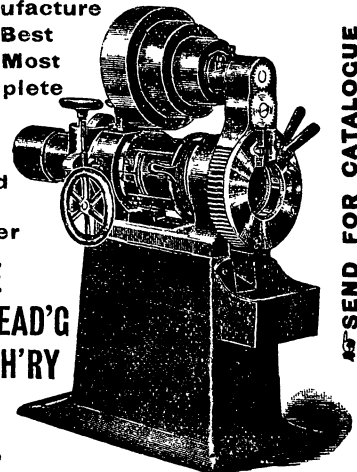
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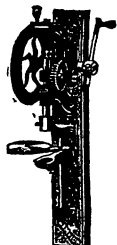
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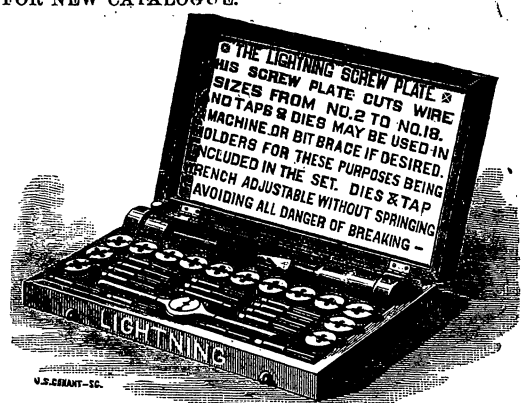
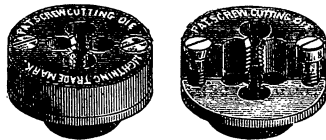
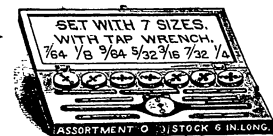
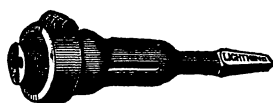
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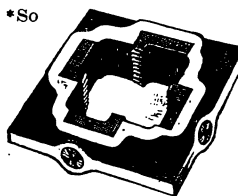
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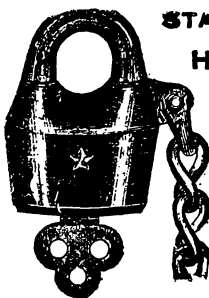


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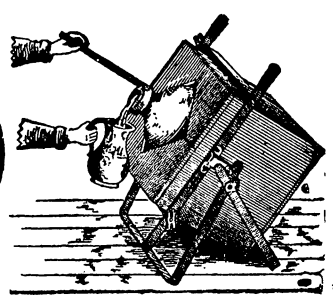
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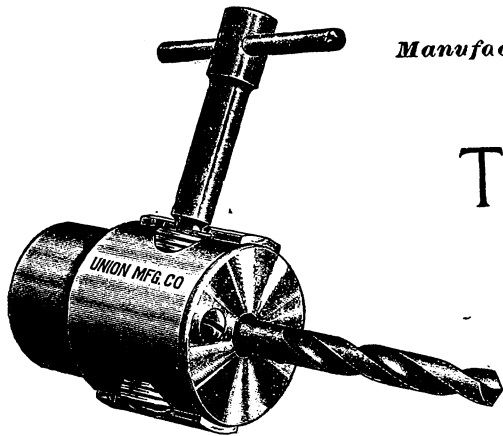
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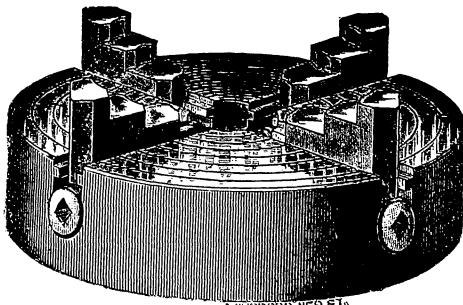
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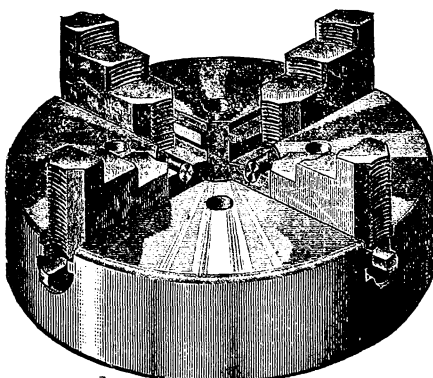


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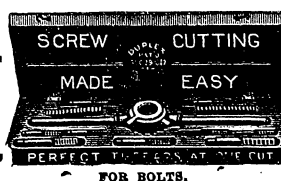


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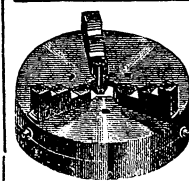


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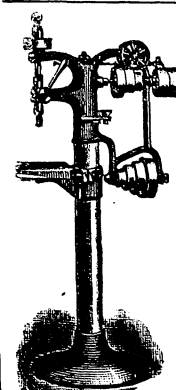


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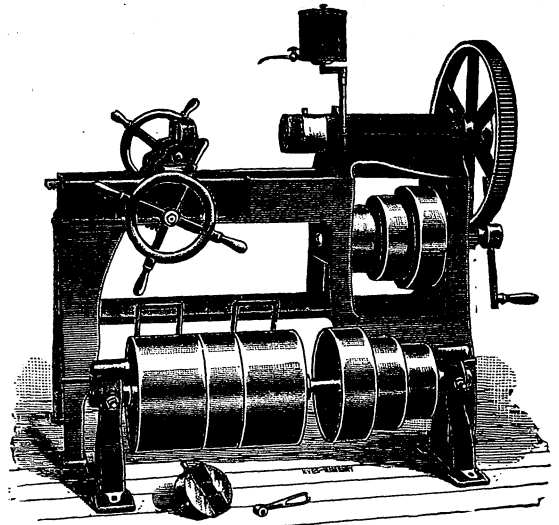
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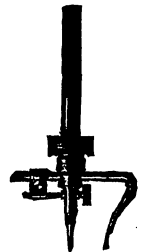
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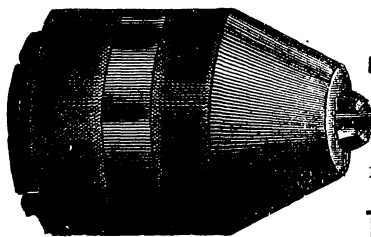


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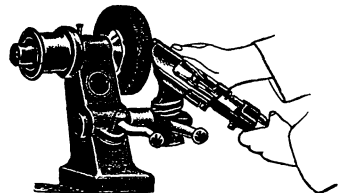
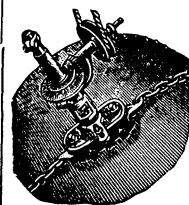
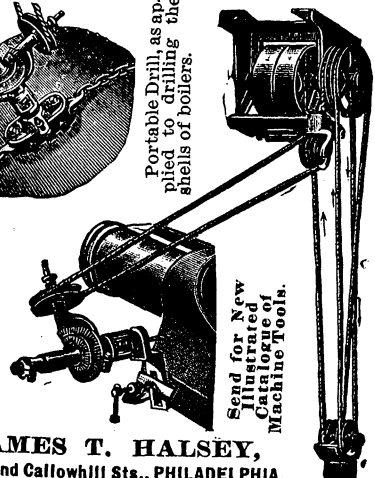
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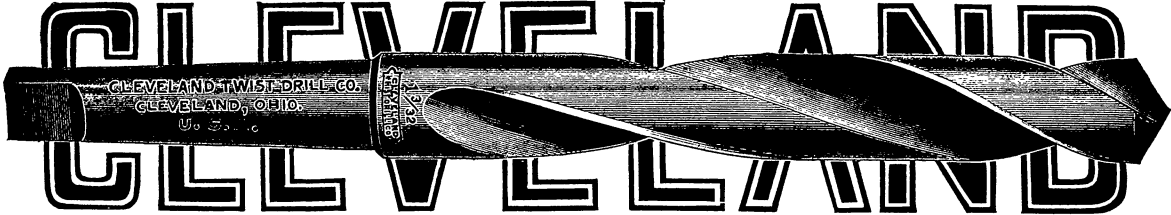
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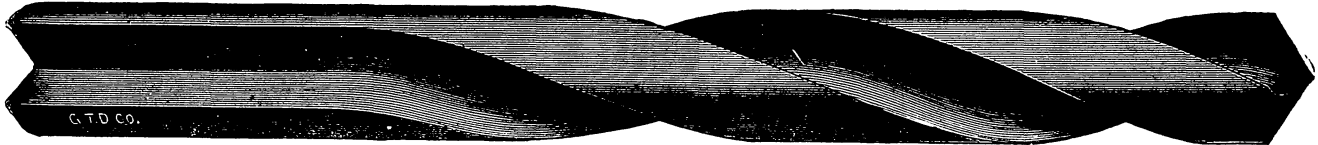
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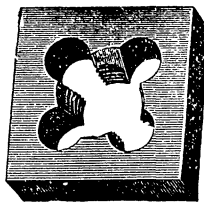
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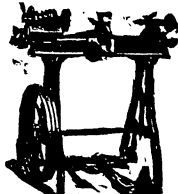
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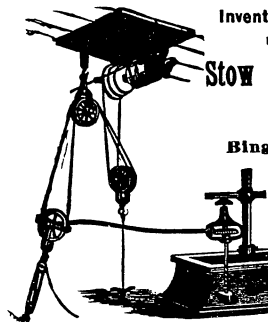
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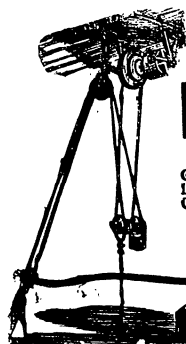
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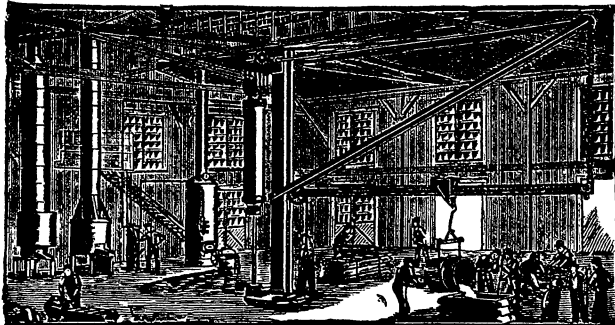


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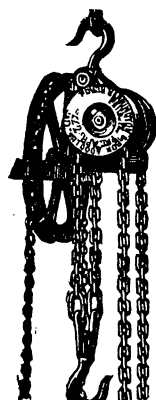
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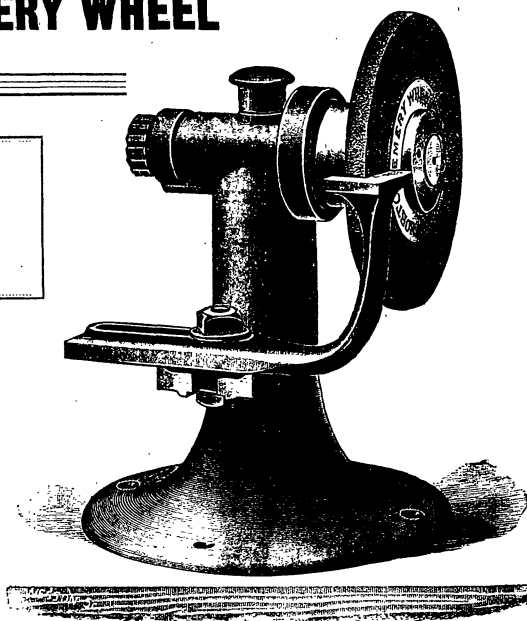
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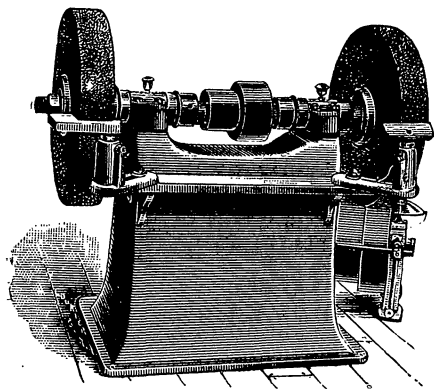
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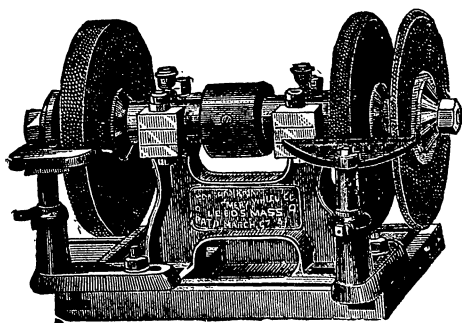
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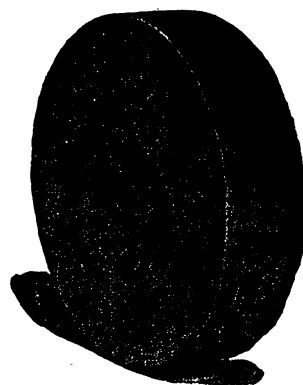
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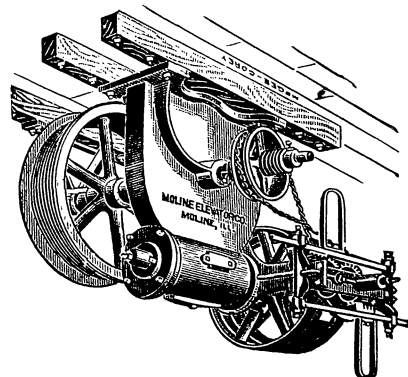


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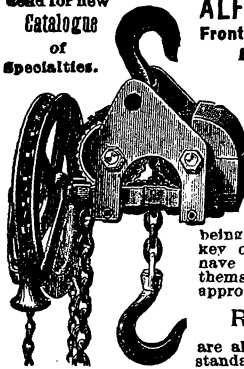
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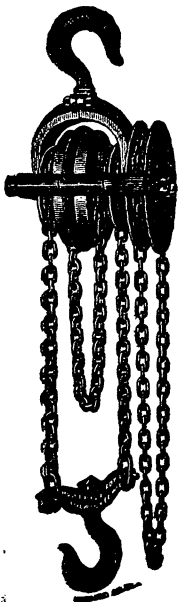
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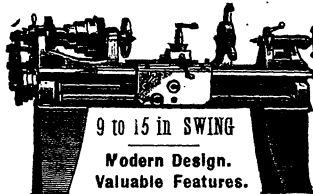
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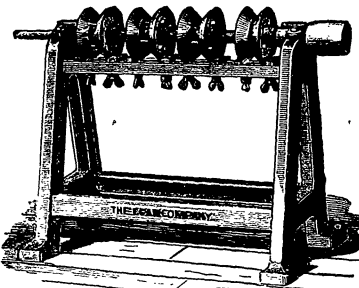
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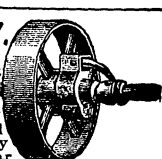
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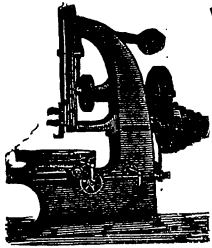
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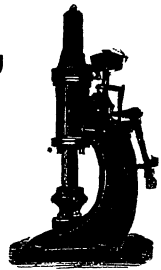


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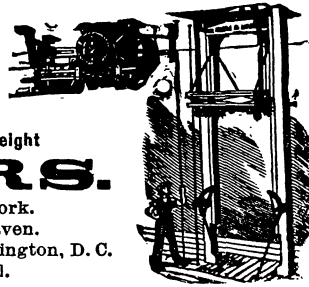
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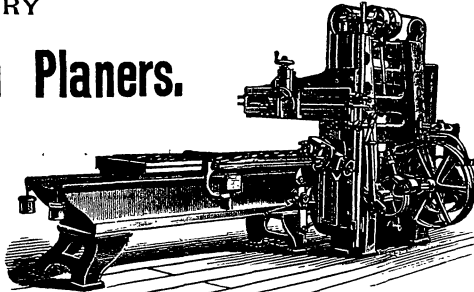
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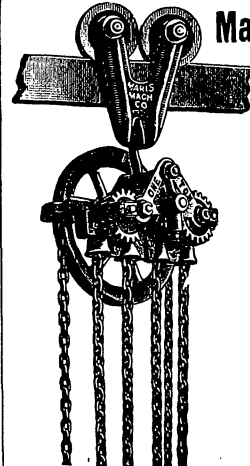
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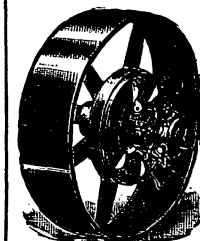
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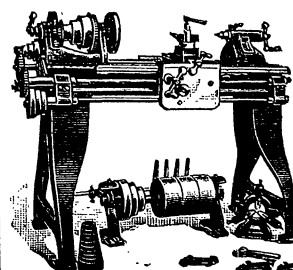
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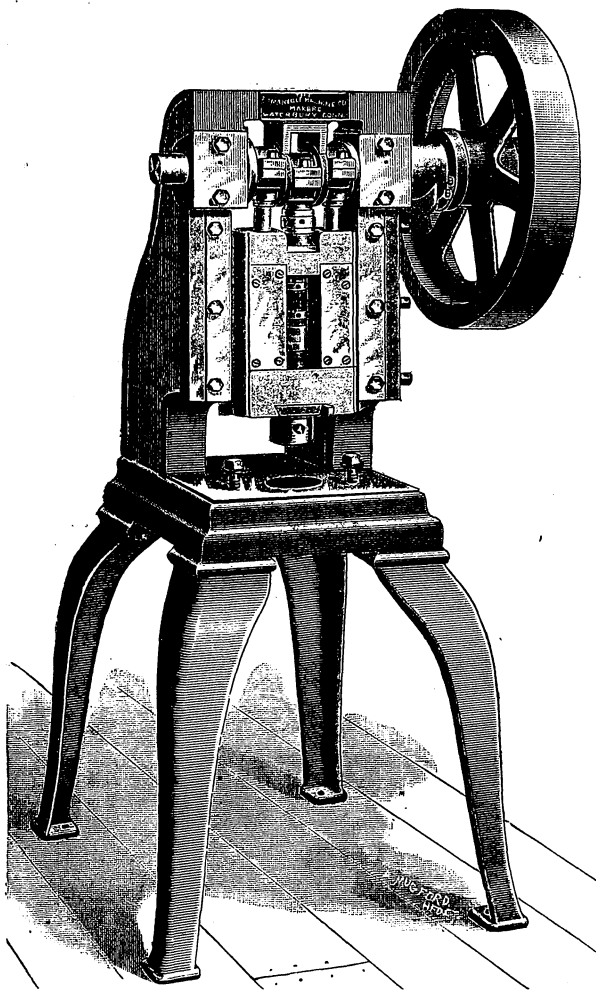
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**SPECIAL
 AUTOMATIC
 MACHINES.
 POWER PRESSES.
 WIRE-WORKING
 MACHINES.**

THE
Lodge & Shipley
Machine Tool
Co.,

107-113 Culvert St., - CINCINNATI, O.

DETAILS

OF

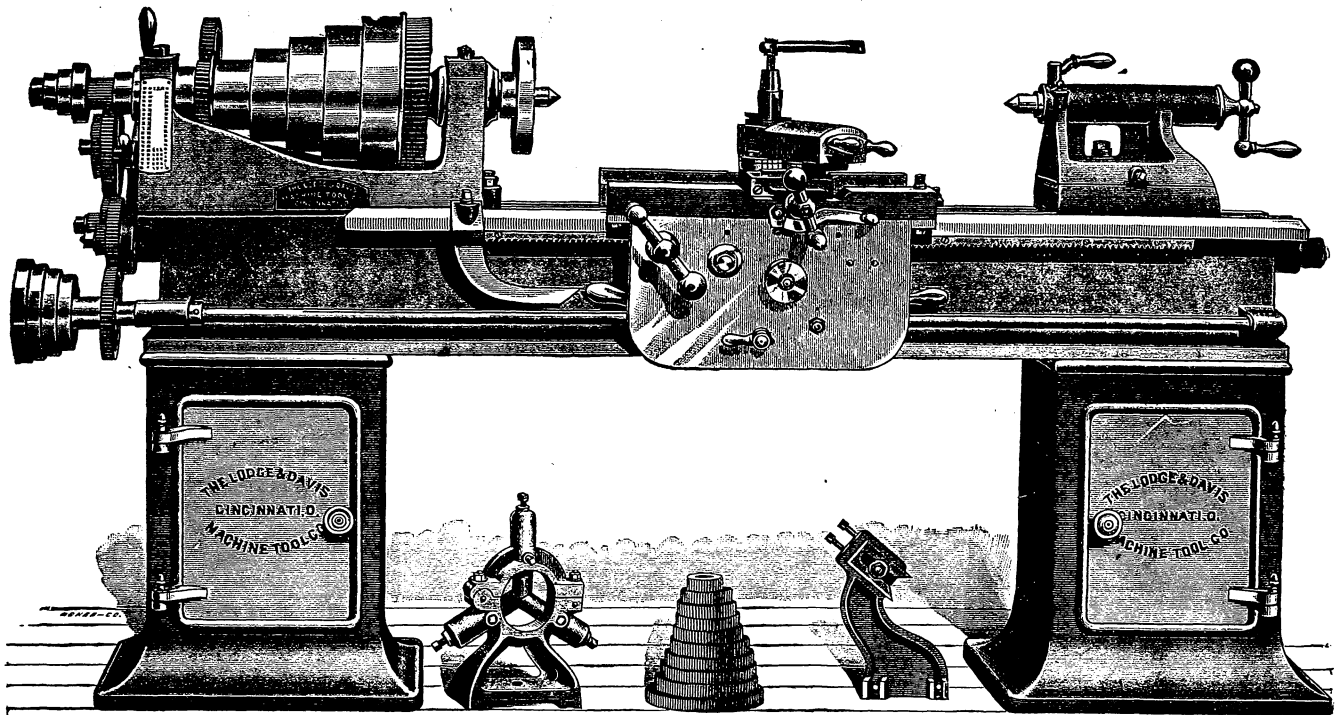
ENGINES AND PUMPS

May be manufactured at a greatly reduced cost on our

ENGINE DETAIL MACHINE.

OUR CELEBRATED TOOL ROOM LATHE.

Write for full description and list of users.



THE LODGE & DAVIS MACHINE TOOL CO.,

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68 and 70 Sou. Canal St.

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21 and 23 Fremont St.

COMPLETE MACHINE SHOP EQUIPMENTS.

CHANGE IN PRICES.

In accordance with our practice of reducing the prices of all our products as fast as is consistent with good quality and cost, we have to-day determined upon another change—the price of the **No. 3 Universal Milling Machine** is again reduced.

The prices of the Universal Grinding Machines and the No. 1 Universal Milling Machine were reduced, respectively, Jan. 14th, and Feb. 10th.

Particulars given on application.

BROWN & SHARPE MFG. CO.

PROVIDENCE, R. I., Feb. 23, 1893.

New Machinery in Stock.

Lathes.
 1 32 in. x 16 ft. Fay & Scott. Compound Rest.
 1 28 in. x 12 ft. " " " " " "
 1 24 in. x 24 ft. Forsaith. Compound Rest.
 1 24 in. x 10 ft. Forsaith. Complete.
 1 22 in. x 12 ft. Field. Compound Rest.
 1 21 in. x 12 ft. Dexter. Compound Rest.
 1 20 in. x 18 ft. Hubbard. Compound Rest.
 1 20 in. x 8 ft. Extra Heavy. First-class.
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 1 17 in. x 6 ft. Dexter. Power Cross Feed.
 1 16 in. x 8 ft. Blaisdell. Raise and Fall Rest.
 1 16 in. x 8 ft. Porter. Complete.
 1 16 in. x 8 ft. Blaisdell. Raise and Fall Rest.
 1 16 in. x 8 ft. Dustan & Hubbard. Complete.
 1 16 in. x 8 ft. Dexter. Power Cross Feed.
 1 16 in. x 8 ft. Porter. Complete.
 1 16 in. x 8 ft. Porter. Complete.
 2 15 in. x 8 ft. Sebastian-May.
 1 14 in. x 6 ft. Prentice. Complete.
 1 12 in. x 5 ft. Sebastian-May.
 2 10 in. x 4 ft. Reed. Complete.
 1 13 in. x 5 ft. Speed Lathe.
 4 10 in. x 4 in. Star Lathe, Foot or Steam Power.
 1 9 in. x 54 in. Star, Foot or Steam Power.
 2 8 in. x 36 in. Foot Lathes.

Planers.
 1 36 in. x 20 in. x 12 ft. Davis.
 2 30 in. x 30 in. x 8 ft. Davis.
 1 24 in. x 24 in. x 6 ft. Davis.

Drills.
 6 32 in. Davis, B. G. & S. F.
 1 28 in. Blaisdell, B. G. & S. F.
 1 28 in. Snyder.
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 1 16 in. Bench Drill.
 2 12 in. Davis. Semi-Sensitive.
 2 Woodward & Rogers Semi-Sensitive.
 1 Barnes 3 Spindle.
 2 16 in. Sensitive. New. Cheap.

Shapers.
 1 20 in. Juengst, Friction.
 1 20 in. " Crank.
 1 15 in. " Friction.
 1 15 in. " Crank.
 2 15 in. Davis Crank.
 1 12 in. Boynton & Plummer.

Milling Machines.
 1 No. 4 1/2 Garvin.
 1 No. 3 Garvin.

Cutting-off Machines.
 1 each 3 and 4 1/2 in. Davis.

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Rochester, N. Y.
 Send for Complete List.

CORLISS,

Wright, Porter-Allen, Buckeye and Slide
 Valve Engines, Boilers, Pumps, &c.

20 x 48 Corliss Engine. 13 x 36 Slide Valve Engine.
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 30 x 72 Corliss Engine. 16 x 48 Slide Valve Engine.
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 11 x 20 Buckeye Engine. 14 x 30 Porter-Allen Engine.

60 H.-P. Westinghouse S. and d Engine, almost new.
 25 H.-P. Westinghouse Junior Engine, in good order.
 8 x 25 Brennan Crusher, good as new.
 40, 80 and 60 H.-P. Horizontal Boilers, insured 80 lbs.
 30 H.-P. Marine Locomotive Boiler, economical.
 Woodward Steam Fire Pump, 1000 gallons capacity.
 Worthington Duplex Pump, 10 x 6 x 10.
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 Three Ingersoll Rock Drills. One 8-ft. and one 9-ft.
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Corliss Jet Condenser, 600 H.-P. Two Buckley Condensers, 500 H.-P. each.
 Two Blake Duplex Pumps, 6 x 4 x 7.
 One Blake Pump.
 Emery Grinder. Boring Bar. Two Platform Scales.
 Boiler Iron Tanks, 800 and 200 gallons capacity.
 Automatic Sawdust Feeder. 100 ft. of 7-in. Pipe.

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 74 Cortlandt St., New York.

I offer 3 20 in. x 24 in. Improved Straight-line

Ingersoll-Sergeant Air Com-
pressors,

built in 1890, and used only seven months at St. Clair Tunnel. Ready for delivery and in first-class condition.

1 24 in. x 60 in. Left-hand Harris-Corliss Engine. May be seen running.

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FOR SALE.

Corliss Vertical Engine, cylinder 32 x 60, latest pattern, high speed; suitable for rolling mill or electric light work. Address
NATHAN BENHAM, Hartford, Conn.

Great Bargains.

**Must be Sold and
 Removed.**

16 in x 30 in. Horizontal Engine.

18 in. x 36 in. Horizontal Engine.

24 in. x 36 in. Horizontal Engine.

19 1/2 in. x 48 in. Beam Engine, with

Knowles Condenser.

Write us for what you want.

LOVEGROVE & CO.,

Third and Quarry Sts., Philadelphia, Pa.

SECOND-HAND MACHINERY.

One Putnam Planer, 26 in. x 26 in. x 8.
 Fine order.

One Car Axle Cutting off and Centering Machine.

One Pond Machine Tool Co. Iron Planer, 40 in. x 40 in. x 24 ft., with two heads.
 In fine order.

One Large Lathe, swings 78 inches over ways, and takes 9 feet between centers.
 Fine order.

One Ferris & Miles 500-lb. Steam Hammer.
 One Belden 100-lb. Upright Power Hammer.

One each 60 lb. and 80 lb. Bradley Helve Hammers.

Send for circular of Second-hand Machinery in stock.

HILL, CLARKE & CO.,

156 Oliver St., Boston, Mass.
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LATHES IN STOCK:

18 x 6,
 18 x 8,
 21 x 10.

Hendey Make. Get price.

THE SCRANTON SUPPLY AND MACHIN-
ERY CO.,

Scranton, Pa.

SOME BARCAINS HERE.

1 32 x 32 x 9 New Haven Planer
 1 Hendey Shaper, 15 in. stroke, imp. vise; new.
 1 30 x 30 x 5 New Haven Planer.
 1 14 x 6 Screw Cutting Engine Lathe; new.
 1 26-in. Diamond Auto. Knife Grinder, used 1 month.
 1 28-in. " " Face
 1 No. 1 " Universal Face and Angle Grinder, used 1 month.
 1 3-Spindle Garvin Drill Press used 1 month.
 1 16-in. Crank Shaper.
 And other machinery, new and second hand. Write for prices. **Machinists' Supply Company,**
 39, 41 and 43 Central Ave., Rochester, N. Y.

FOR SALE.

**Centre and Side Bearing
 Steel Street Rails,**

All fit to relay and in lots to suit. Apply to

F. E. PERKINS & BRO.,

59-73 West St., Brooklyn, N. Y.

MACHINERY,

NEW AND SECOND-HAND, FOR SALE.

80 in. swing, 18 1/2 ft. bed, Triple Geared, Screw Feed.
 60 in. " 45 ft. " " " " " "
 52 in. " 35 ft. " Rod Feed, with Hor. Boring
 mach one end of bed.
 50 in. swing, 30 ft. bed, For Rolling Mill Forgings, New
 30 in. " 28 ft. " Pond Mach. Tool Co. Shifting
 Lathe. Al.
 32 in. swing, 16 ft. bed.
 32 in. " 20 ft. bed, centers, Engine Lathe. D. W.
 Pond.
 28 in. swing, 22 ft. bed, Engine Lathe. Cheap.
 24 in. " 10 ft. " " " " "
 24 in. " 12, 16, 20 and 24 ft. bed, Engine Lathes. New.
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 16 in. " 6 and 8 ft. " " " " "
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 15, 18 and 25 in. stroke Crank Shapers, Steptoe. New.
 22, 26 and 30 in. " Geared " " "
 9 in.-16 in. " Crank " Good order.
 15 in. and 24 in. " Friction " " "
 30 in.-32-24-26-30-36 in. Drills. New and Second-hand.
 15 in. x 3 ft. and 20 in. x 4 ft. Planers.
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 30 x 30 x 8 ft. Planer. D. W. Pond.
 42 x 42 x 16 ft. " B. & D.
 54 x 42 x 24 ft. " 2 heads. Betts.
 62 x 61 x 10 ft. " Bement.
 11 x 18 Horizontal Slide Valve Engine.
 40 H.-P. Vertical Engine. Al.
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 Lincoln Pattern Millers, Gang Drills, Screw Machine,
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 Flanging Machine for Boiler Heads.

GEO. PLACE MACHINE CO.,

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STEAM PUMPS.

1 14 in. x 9 in. x 18 in. Cameron; brass lined.
 1 14 in. x 8 in. x 10 in. Worthington Duplex.
 2 10 in. x 5 in. x 12 in. Niagara; solid brass.
 1 12 in. x 10 in. x 12 in. Guild & Garrison.
 1 10 in. x 6 in. x 12 in. Epping & Carpenter.
 1 12 in. x 7 in. x 14 in. Epping & Carpenter.
 1 16 in. x 9 in. x 18 in. Niagara.
 1 8 in. x 5 in. x 10 in. Delamater Duplex; new.
 1 14 in. x 12 in. x 18 in. Blake.
 Send for new catalogue.

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MARVIN BRIGGS, 61-63 Rutgers Slip, N. Y.

SECOND-HAND MACHINERY.

CORLISS ENGINES.
 30 x 60 Harris-Corliss.
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 16 x 48 G. H. Corliss.
 14 x 30 Wetherill-Corliss.
 12 x 36 G. H. Corliss.
 12 x 30 G. H. Corliss.
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 8 x 16 x 16 Fore and Aft Compound Propeller Engine.
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 2 x 3 1/2 x 3 1/2 Fore and Aft Compound Propeller Engine

AUTOMATIC CUT-OFF.

24 x 36 Babcock & Wilcox.
 14 x 18 Halsey.
 13 x 12 Phoenix.
 12 x 12 Ball.
 5 x 7 Payne.
 150 H.-P. Westinghouse.
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 PLAIN.
 SLIDE VALVE
 ENGINES.

Boilers, Pumps, Dynamos and

GENERAL MACHINERY.

MARVIN BRIGGS, 61-63 Rutgers Slip, N. Y.

SECOND-HAND MACHINERY.

Boring Mill, 10 ft. 4 in. swing, 56 in. under cross rail, table 7 ft. 6 in. in diameter.

Boring Mill, 8 ft. 4 in. swing, 48 in. under cross rail, table 6 ft. 6 in. in diameter, two heads on cross rail.

Two 7-ft. **Engine Lathes,** 7 ft. between centers, face plates 6 ft. 3 in. in diameter.

76-in. **Planer,** 13 ft. long; heavy and powerful.

48-in. **Car Wheel Borer.**
Axle Lathe.

Write for photographs and further particulars.

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BAKER BLOWERS, Nos. 1, 3, 4, 4½, 5, 6 and 7.
ROOT BLOWERS, Nos. 2, 4, 4½, 5, 6 and 7.
 Sturtevant Blowers, Nos. 6, 7 and 8.
 2 12 and 1 15 H.-P. Horizontal BOLLERS; new, very cheap. 10 in. x 7 in. Blake Crusher; equal new. Cor. Lumber Saws, 12 in., 18 in., 24 in., 30 in. and 36 in. in. hole. Large Bommer, 6 Bescher, 6 Nana Fly Wheel Pump, 14 in. x 7 in. x 10 in., brass lined.
 Purchasers of machinery and those who have it for sale will do well to correspond with C. R. BIGELOW, New York City, Expert and Appraiser, 45 Dey St., New York City.

**We cut them up for Scrap Iron.
Will buy old Boiler Plate in rings
and sheets 1-4 in. thick and
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1 80 in. x 30 in. x 8 ft. Pease Planer, latest make.
 12 in. x 5 ft. Young Engine Lathe.
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 1 Hendey 6-Spindle Automatic Drill.
 1 Cold Sawing Machine for iron or steel.
 1 Putnam Axle Crane, with 2 Crabs.
 All sizes of Bendable Lathes and Shapers in stock;
 also Hand and Power Punches, Shears, Power and
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DANIEL KELLY, 51 N. 7th St., Phila., Pa.

Corliss Engine, 14 x 36; first-class condition.
Plain Engine, 12 x 30; good order.
Belt Wheel, 8 ft. diam., 20 in. face, 7 in. bore.
Belt Wheel, 10 ft. diam., 13 in. face, 6 1/2 in. bore; split
Belt Wheel, 11 ft. diam., 18 in. face, 13 in. bore; split.
2 Sturtevant Fans, 8 ft. high.
Clutch Pulley, 60 in. diam., 23 in. face, 5 7-16.
Large assortment New and Second-hand Machinery
Shipping, Pulleys, Belting, Tools, Iron, &c.

A full set of Automatic Cut-off Engine Patterns, with drawings, wood cuts and patent right to manufacture; are almost new, and were made by the finest workmen. If sold at once will let them go at a sacrifice. Address "ENGINE," No. 112, office of *The Iron Age*, 98-102 Reade street, New York.

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12 Drill Presses, new, different sizes.
800 Truck Wheels, new, 1½ cts., New York.
 All guaranteed fully.
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Four second-hand 75 H.-P. Double-Deck Boilers, with all fittings and fixtures. In first-class condition. Cheap.
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One 18 x 22 Side Crank Engine.
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Full line of new and second-hand Boilers and Engines always on hand.
H. M. Sciple & Co., 3d and Arch Sts., Philadelphia, Pa.

One 16 x 24 in. Standard Gauge Locomotive.
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One 7 x 12 in., 36-in. Gauge Locomotive.
Fire Box Boilers from 1 to 15 horse-power in stock; Engines, Boilers, Shears.
Hoisting Engines, Derricks and Contractors' Machinery.

Second-hand Machinery, Pulleys, Shafting and Belting.
Two Slide Valve Steam Engines,
 20-inch cylinders, 48-inch stroke.

These engines are geared at right angles and placed upon extra heavy iron frame. The front spur wheel gear shaft on which there is a 1-foot 6-inch spur wheel gear has a 1-foot pinion wheel of corresponding strength. Judson governor on engine of the proper dimensions. Also one battery of five steam boilers each 24 feet long, 42 inches in diameter, with two 16-inch flues in each, complete. 2000 feet shafting, assorted lengths, diameter from 1½ to 4 inch s, 500 assorted from 6 to 18 inches to 2000 feet on hangers to suit shafting, one 16-inch ground leather belting from 4 to 18 inches in width. All the above in first-class condition and for sale at a low figure in large or small lots to suit the purchaser.

The Faber Machinery Supply Co., Pittsburgh, Pa.

Can furnish stacks, grates and all fittings to suit purchasers.

1 Cameron Pump, No. 12 Special.
2 Guild & Garrison Pumps, No. 3.
2 Small Pumps.
1 3 in. x 12 in. Vertical Engine.
1 Dimpfel's Blower, 5 ft. and 20 in.

DAN'L W. RICHARDS & Co.
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2 Double Deck Boilers about 40 H.-P. each, good and cheap. 2 Iron Tanks, 8 ft. in diameter, 30 ft. long, 3-8 iron, 11,000 gallons capacity. Cylinder Boilers for Steam 40 and 42 in. diameter. Other Boilers from 10 in. up to 20 and 30 ft. long. Horizontal Engine, Round and Square Iron Tanks, different sizes. Dealers in all kinds of Scrap Iron, New and Old Metals and Machinery.

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Write us for Bargains.

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Plate Mill suitable for nail works. For particulars, &c., address
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Office of *The Iron Age*, 220 South 4th St.,
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25 lb. section iron T Rails in good condition for relaying.

WM. H. PERRY & CO.,

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Extra strong, with engine attached 17 x 24 in.
Weight of Squeezer alone 95,000 lbs. In use
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100 tons Malleable Iron Scrap.
 125 tons old Sand and Chilled
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 100 tons old Boiler Plate, cut apart.
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G. W. SCHULTZ & CO.,
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One Hor. Engine, 24 in. x 28 in., 15-ton wheel.
12-in. three-high Merchant Train Rolls.
18-in. Break Down Train.
One Roll Turning Lathe.
One Heavy Sash Shear to cut rails.
One Fan Blower and Hot Iron Saw.
Two Small Engines.
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300 tons 35 pound Iron Tees, with Fastenings.
 50 " 30 " " " " "
 50 " 48 " " " " "
 50 " 16 " " " " "
 250 " 52 " Johnson Girder Steel Rails,
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 1000 tons Flat Steel Street Rails.
 200 Narrow Gauge Flat Coal, Box and Stock Cars; 5
 Coaches, 7 Caboosees, 4 Mall and Baggage, 10 Boarding
 30 Hand and Push Cars and 7 Standard Gauge Loco-
 motives.
 I am in the market at any time to buy or sell any-
 thing in the way of second-hand Equipment, Rails,
 also scrap. In answering this mention this paper.

L. K. HIRSCH.

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Rolling Mill and Nail Factory of the Lewisburg Iron and Steel Co. Mill supplied with water, slate roof buildings, 2 engines, 4 large tubular boilers, 7 puddling furnaces, 1 large heating furnace with boiler over same, 42 nail machines, 2 trains of rolls, and other machinery. Connection with Pennsylvania R.R. and Philadelphia & Reading R.R. Tracks on both sides of mill. Works now in operation. Address ALFRED HAYES, Secretary, Lewisburg, Union Co., Pa. =

About one mile from Court House.

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One Knowles Improved Fly Wheel Compressor. In use but a few weeks; 8-in. steam cylinder, 10-in. air cylinder, 12-in. stroke; water jacketed air cylinder. Address

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A second-hand Compound Condensing Engine in A1 condition, capable of developing 500 to 1000 H.-P. at a speed of from 150 to 250 revolutions per minute under a steam pressure of say 100 lbs. State maker's name, when built, how much used and where can be seen. Give full description and state lowest spot cash price.
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THE WILMOT & HOBBS MFG. CO.,

Bridgeport, Conn.

$\frac{5}{8} \times 7-16$	$1\frac{1}{8} \times \frac{5}{8}$
$\frac{3}{4} \times \frac{1}{4}$	$1\frac{3}{4} \times 1\frac{1}{2}$
$1\frac{1}{2} \times 7-16$	$1\frac{3}{4} \times \frac{5}{8}$
$1\frac{1}{8} \times \frac{1}{2}$	$2 \times \frac{5}{8}$
$1\frac{3}{8} \times 5-16$	$2\frac{1}{2} \times \frac{1}{4}$

If interested in these sizes write to
CHARLES C. LEWIS,
 Iron and Steel Merchant,
 Springfield, Mass.

In the matter of the voluntary dissolution of "The Albany Stove Company," the undersigned, as Receiver, will sell at public auction at the City Hall, in the city of Albany, N. Y., on the 20th day of March, 1893, at 12 o'clock noon of that day, the real estate, buildings, consisting of foundry, engine room, mounting shop, warehouses, sheds, and racks, tables, benches, tanks, machinery, tools, implements, patterns, shop rights and flasks of the said "The Albany Stove Company," all of which property is situated in the city of Albany, N. Y.

JOHN GUTMANN, Receiver.

FOR SALE.

Complete Bessemer Plant, second-hand, by Galloways, Manchester. Only done 18 months' work. Consisting of one pair of High Pressure Vertical Blowing Engines, Cylinders 30 inch steam, 42 inch air, 4 feet stroke. Hydraulic Pumps, Accumulator, two eight-ton Converters, One Hydraulic Centre Pit Crane complete and two five-ton Ingot Cranes, Distributing Boxes, Cupolas, Cupola Staging, Lift and Casting Laddies complete.

Drawings and fuller particulars on application to

THOMAS W. WARD,

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VALUABLE BUSINESS PROPERTY FOR SALE.

The owners of the Foundry Property formerly occupied by B. Wiltse & Co., in Catskill, will sell the Dock and Real Estate, including buildings, machines, machinery, tools, fixtures and patterns, at public auction, at the Court House in Catskill, N. Y., on Monday, March 13, 1893, at 2 P. M., to the highest bidder. Buildings all brick with slate roofs. Molding room has 20 to 25 ft. ceiling, and contains 3000-lb. cupola, large swing crane, core oven, brass furnace; machine shop and engine room (ground floor) contain 25 H.-P. engine and boiler, two 8-ft. lathes with 16-in. swing, two 16-ft. lathes with 30-in. swing, an 18-ft. planer, upright drill, large boring lathe with 20-ft. swing, vice benches, &c.; pattern shop (second floor) contains wood-turning lathe, face lathe, work benches, &c. This sale is necessary to close up an estate, and gives a rare opportunity for a person desiring a foundry or other business property. For further information inquire of JENNINGS & CHASE, or VEDDER & WILTSE, Catskill, N. Y.

FOR SALE.

One 6 in. x 6 in. Vertical Hoisting Engine and Boiler combined, in good condition. Apply to

THE D. R. LEAN CO.,

Pittsburgh, Pa.

An old established

Iron Manufacturing Firm

of Pittsburgh, who have space and power to spare, would like to add to their business the manufacture of electric supplies or specialties for railroad or other use, that would consume part of their product, or that could be made an adjunct of the iron business. Those having anything in the above line, in actual use or in prospectus, who desire such connection can address

"IRON WORKS,"

office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa., with information covering merits of articles to be manufactured, and same will be carefully considered and appointment made if found suitable.

WANTED.

Responsible parties to manufacture and sell on royalty, a cheap portable steel or iron **CULVERT BRIDGE**; it is adapted to all small streams, runs, etc., in roads, streets, **RAILROADS**, etc.; improved roads is the order of the day; use this bridge, put it below the level of the road, cover it over and thus prevent jarring and wear and tear of vehicles, etc. Apply to

W. A. NICHOLS,

Girard Building, Philadelphia, Pa.

Agencies Wanted.

A gentleman of large experience in selling the Mississippi and Missouri River jobbing trade desires to secure agencies for staple manufactured goods in the iron trade; salary or commission; satisfactory references. Address

"JOSEPH,"

office of *The Iron Age*, 59 Dearborn St., Chicago.

FOR SALE.—Manufacturing Interest.

Parties desiring to change their business relations will sell their stock in a well established, prosperous and growing corporation located in Chicago, manufacturing specialties and a staple line of steam and plumbing goods. The stock earns large dividends annually and is an excellent investment. Full particulars upon application. Address "STOCK,"

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WHERE TO LOCATE NEW FACTORIES.

The Illinois Central Railroad Company is desirous of calling the attention of capitalists and manufacturers to the advantages possessed by the different cities and towns on their Southern Lines and on the lines of the Yazoo & Mississippi Valley Railroad Company in the shape of

UNLIMITED RAW MATERIAL, PROXIMITY TO MARKETS, CHEAP LABOR,

Fuel, etc., and believes that it needs but a presentation of their merits to attract the careful attention of all interested in converting the raw materials to be found on their lines into the finished product. Prominent among these are cotton, hard and soft wood, clay, fruits, vegetables, etc. A descriptive pamphlet of 150 pages, entitled "Where to Locate New Factories," has been issued by the Company, and a copy will be sent free on application to the undersigned, who will also give any further information as to

Inducements Offered

by the different localities for desired industries. Individuals or companies wishing to embark capital in cotton, clay, wood-working, canning or other industries, can find a profitable field and hearty co-operation. For particulars address GEO. C. POWER, Industrial Commissioner I. C. R. R., 58 Michigan Ave., Chicago.

FOR SALE AT ROCKAWAY, N. J.

A valuable Mill property in first-class condition, on the line of the D., L. & W. and N. J. Central Railroads, containing 14 acres of land, water and steam power, two turbine wheels, one large mill suitable for axe or machinery works, three new two-story blacksmith, machine and pattern shops, three dwellings, dynamo and other buildings. The water is pure and suitable for silk or paper factories or dye works. Apply to W. A. TORREY, 6 Wall St., New York

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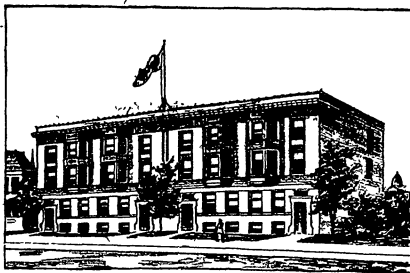
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BY A THOROUGH Mechanic to take charge of hardware factory; practical pattern and tool maker and posted in all the departments; long experience in handling men; references. Address "BEN," office of *The Iron Age*, 96-102 Reade St., New York.

FOUNDRY FOREMAN is open for engagement with parties where sobriety and push will be appreciated; understands mixing and melting of irons; 15 years' experience as foreman in first-class shops; distance no object. Address "PUSH," Box 39, office of *The Iron Age*, 96-102 Reade St., New York.

SALESMAN, with an experience of 13 years in jobbing and retail hardware, desires permanent engagement with responsible builders' hardware firm; capable of filling position as buyer; exceptional references. Address "BRONZE HARDWARE," office of *The Iron Age*, 59 Dearborn St., Chicago.

A YOUNG MAN having six years' experience in the wholesale hardware and supply business desires position; can furnish best of references. Address "THOROUGH," No. 39, office of *The Iron Age*, 96-102 Reade St., N. Y.

A FOREMAN of 20 years' experience in rolling mill desires a situation; has a thorough recommendation from last employers; they say he is "capable of superintending the building and rebuilding of puddling furnaces and general repairs to puddling mill, and is, in every way, a reliable and sober man." Address "FOREMAN," Lock Box 1086, Philadelphia.

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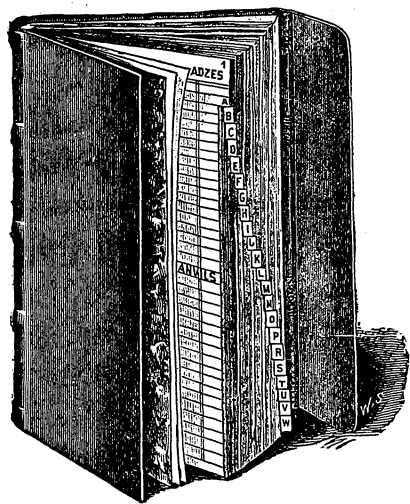
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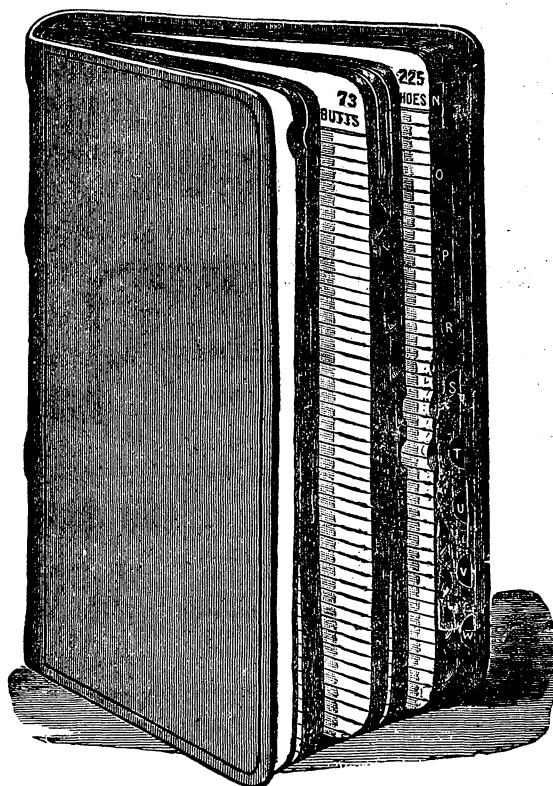
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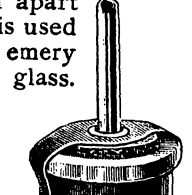
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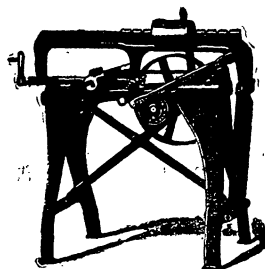
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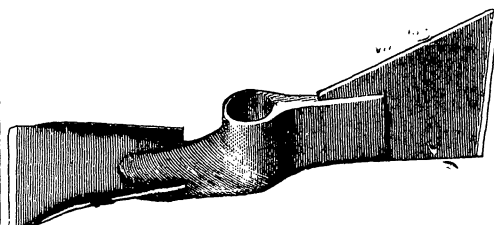
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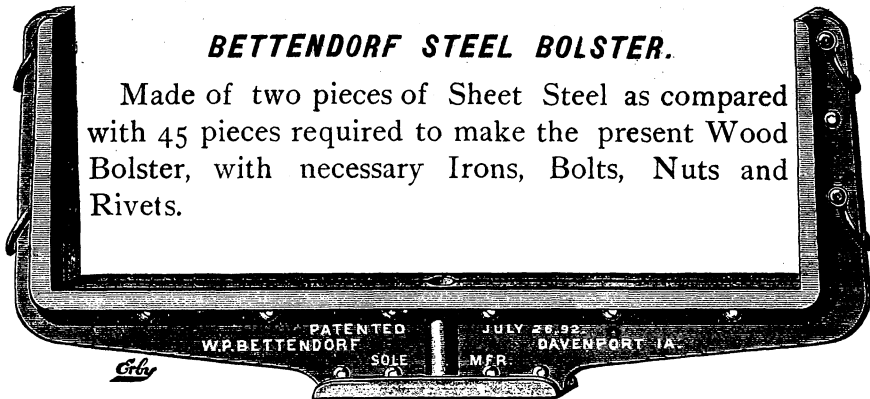
Is designed as a tool for many purposes, such as trimming paths, drives, cutting brush, weeds, thistles or ice, loosening up hard earth in gardens or flower-beds, etc., etc. It has steel blades cast in the head and is one of the most convenient tools for general use ever made, its price bringing it within the reach of all. Address

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Made of two pieces of Sheet Steel as compared with 45 pieces required to make the present Wood Bolster, with necessary Irons, Bolts, Nuts and Rivets.

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Every axle
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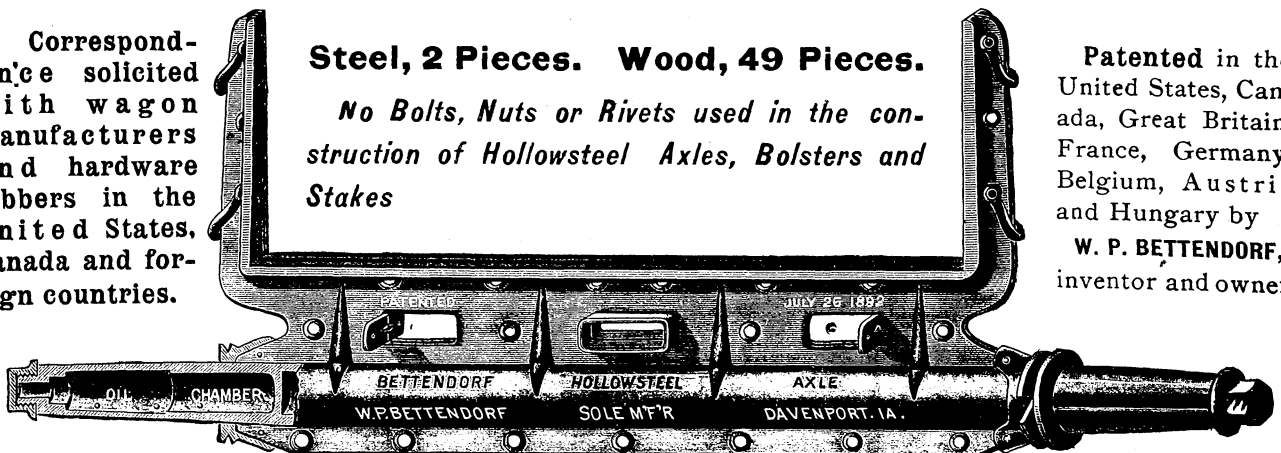
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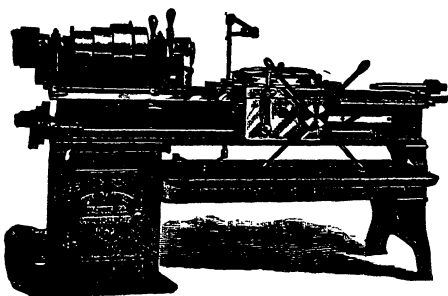
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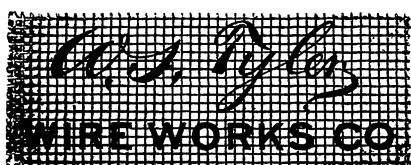
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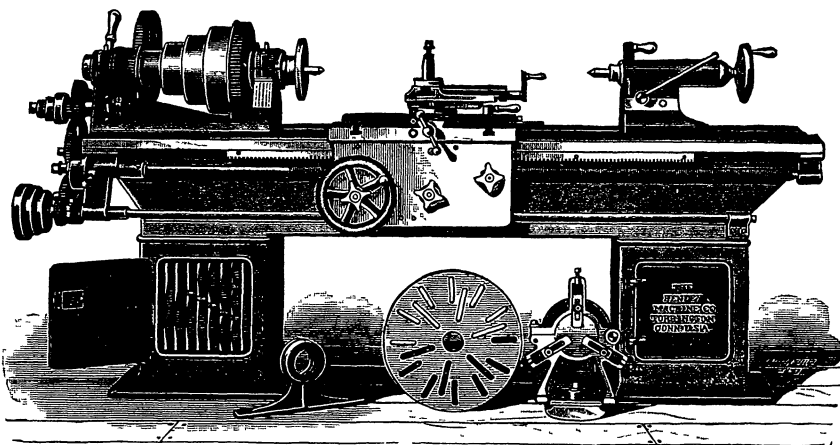
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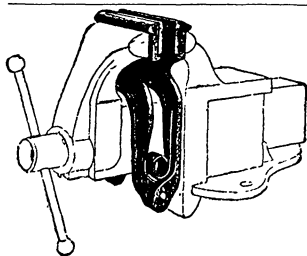
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STOP marring your finished work.

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THE ORIGINAL

HOT FORGED and HAMMER POINTED.

By JUDICIAL DECISION.

Extracts of Judge Coxe's opinion. January, 1893.

"The defendant has advertised its nails upon their own merits, believing them to be the best nails manufactured. There has been no deception, no concealment, no false pretences. These nails have entered the market as the **Ausable Nails** and what reputation they have gained has been *under their own name and upon their own merits.*"

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"were made by the defendant (Ausable) before they were made by the complainant."

"The defendant used the words 'hammer pointed' long before the complainant used them and has so used these words to describe its nails continuously since 1872"

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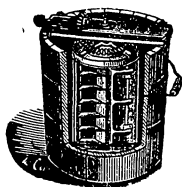
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JAR ENTIRELY COVERED.

No more Spattering.

CAN BE USED ANYWHERE.

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ALWAYS READY FOR USE.

Nothing to be fixed.

SIMPLY PERFECT.

No. 20—Jar holds 1 quart level full, Complete Machine securely packed in one single package. ½ dozen packed in case.

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NORTH BROS. MFG. CO.,

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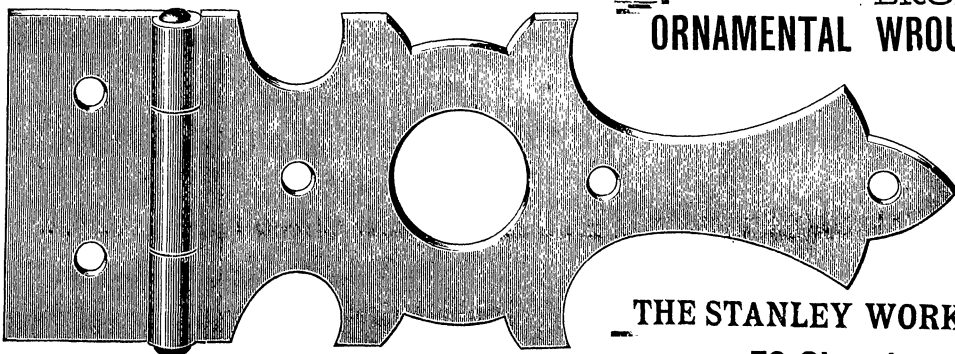
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We are the only Headquarters for Star Hack, Butcher and Bracket Saws.

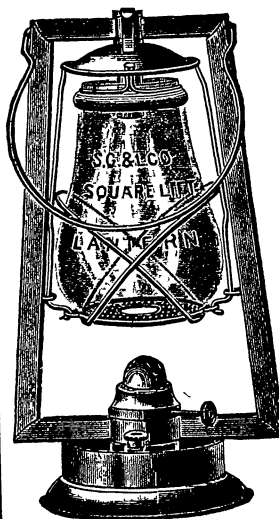
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THE PEOPLE ask for
MAKES FRIENDS and MONEY, and
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**LePage's
Liquid
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It is the strongest and best glue made. It has been imitated, but never equalled. Be sure to get what you order and ACCEPT NO SUBSTITUTES.

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Also a full line of

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HARDWARE
SHELF BOXES** Made of Wood.
No screws or
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Send for circular and list of references

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ROPE AND BINDER TWINE

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DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY, AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 190.

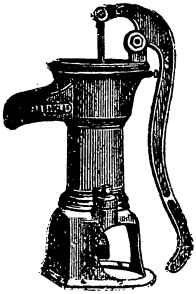
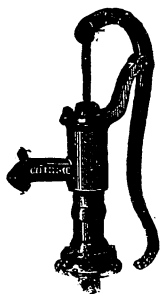


Fig. 78.



or wherever it is desired to raise a large quantity of water by hand power.

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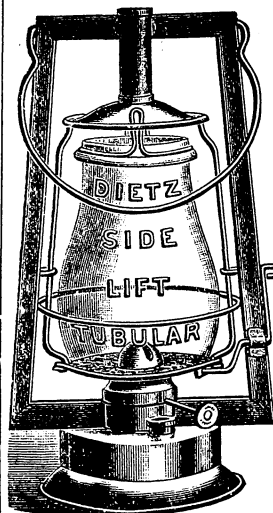
Fig. 209.



Fig. 381.



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is the best. Our goods have stood the test of time and are safe and reliable. The name "DIETZ" is plainly stamped on them. Our specialty is Tubular Lanterns, Street Lamps and Driving Lamps. We make a large variety being the oldest and largest house in our line.

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A NEW CHAIN PUMP

KEHLER'S PATENT
Galvanized Iron Tubing

FOR CHAIN PUMP.

Is guaranteed to be

THE BEST.

IT is made of best quality Gal-

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rust nor accumulate filth.

IT only weighs one-half pound to

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water weighs six pounds or

more per foot.

IT will last longer than wood

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IT will not freeze in any climate.

IT can be attached to any make

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We also manufacture a Gal-

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BELLEVUE PUMP CO.,

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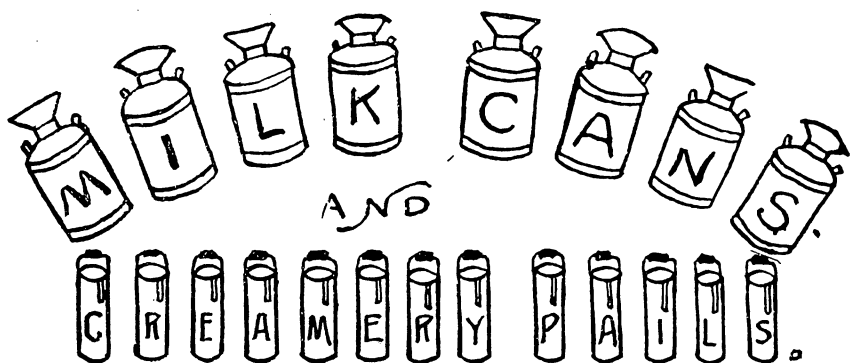
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VALVE will never corrode. Ask your

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MILK CANS MADE UP.

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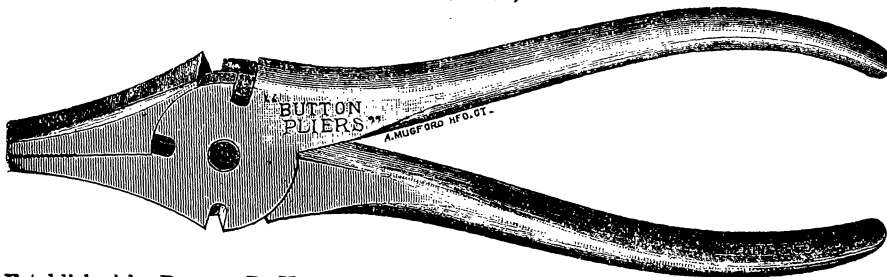
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IT'S UNHEALTHY.

Impure Water Breeds Disease of all Kinds.

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Is endorsed by all scientists and the medical
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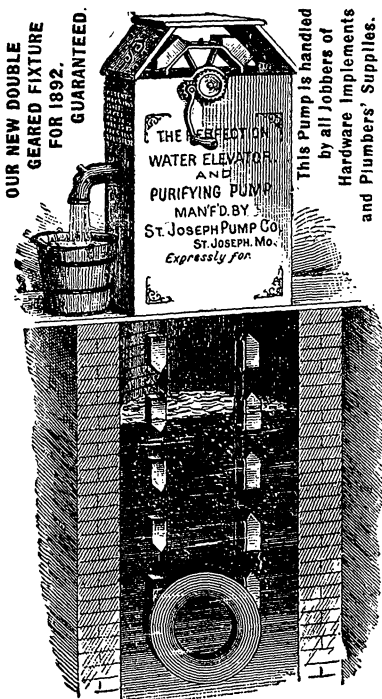
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to double this during the next two
years. Will you help us? and at
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HARDWARE SPECIALTIES.

Exclusive
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Small Steel Springs of every description. MARK Plain, Stamped and Japanned Tinware.
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BUSINESS ESTABLISHED
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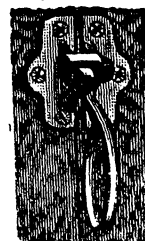
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"CONROY"
Refrigerator Door
Fasteners



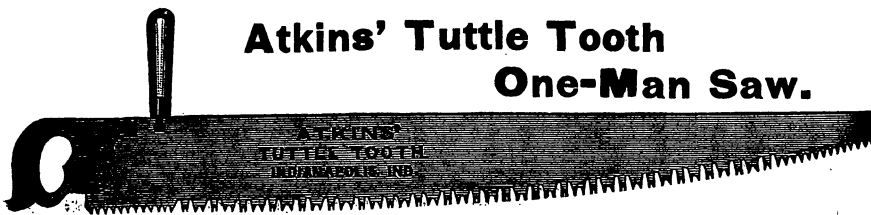
Have rapidly supplanted all
others

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Refrigerator Trimmings.

E. C. ATKINS & CO., Indianapolis, Indiana.

We make a Specialty of Fine High-Grade Saws.



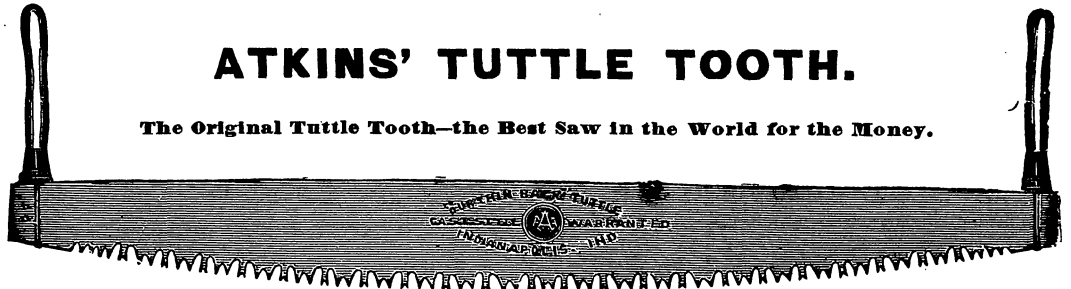
Atkins' Tuttle Tooth One-Man Saw.

BRANCH HOUSES:

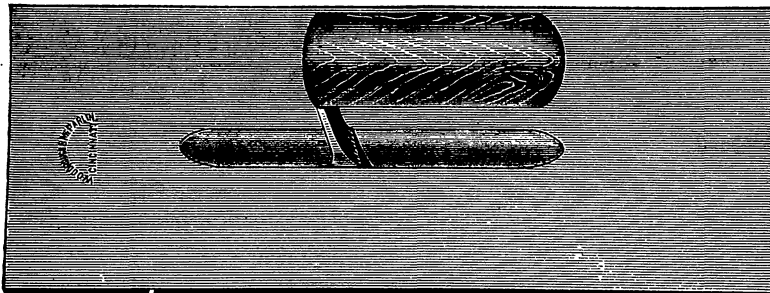
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ATKINS' TUTTLE TOOTH.

The Original Tuttle Tooth—the Best Saw in the World for the Money.



THE NATIONAL SAW CO., 96 AND 98 Reade St., New York.



The famous Woodrough & McParlin Cincinnati Plastering Trowel. "Once Introduced: it sells itself."

The Plastering Trowels manufactured by us have long been favorably known in every city in the United States and Canada. The increasing demand for them by Plasterers attests their Superiority over all others, and confirms their reputation for Uniform High Quality and Durability.

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- 1.—Teeth of uniform thickness.
- 2.—Five Gauges taper in middle of blade.
- 3.—Three Gauges heavier on ends than in center of back.

For 10 YEARS the Simonds Crescent-ground Cross-cut Saw (the only Saw on the market possessing these **ESSENTIALS**) has stood out prominently in contrast with all other makes of cross-cut saws. It has been the **CRESCENT-GROUND** against the **FIELD--MODERN IDEAS** against **ANCIENT METHODS**.

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THE CRESCENT-GROUND CROSS-CUT SAW.

(PATENTED DEC. 26, 1882.)

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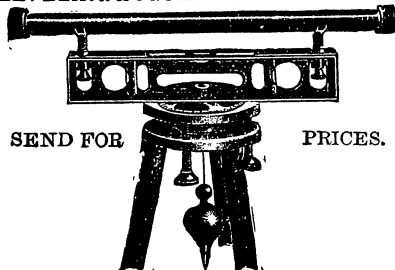
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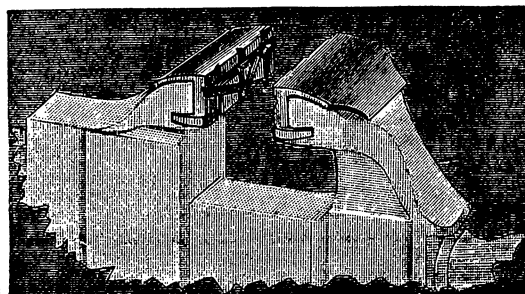
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BINGHAM PATENT VISE JAW CAP

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3 1/4 inch, per pair, 40 cents.
4 " " " " 50 "
4 1/2 " " " " 60 "

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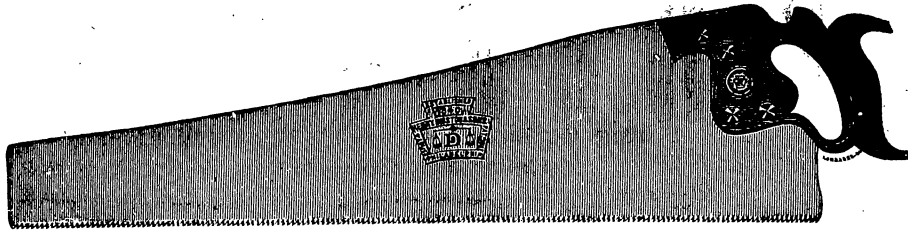
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"If you want a Saw it is best to get one with a name on it which has a reputation.
A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

THE SAWS THAT LEAD THEM ALL

DISSTON & SONS' PATENT D-8 HAND SAW.

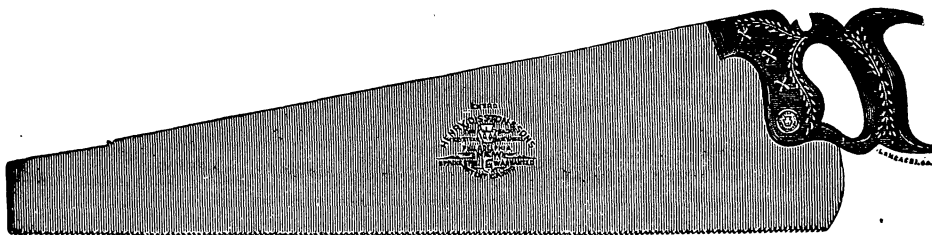
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HOW
TO
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IT,
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This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

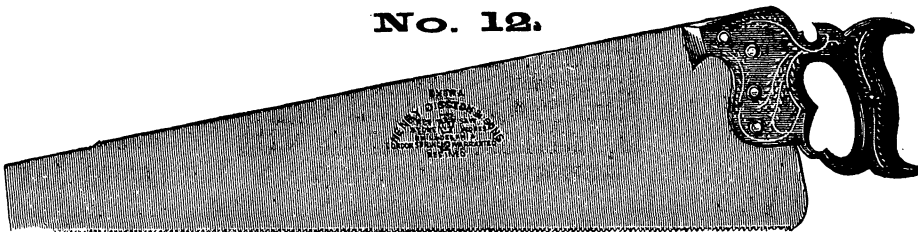
Our New No. 16 Premium Saw.



AN EXTRA FINE SAW IN EVERY RESPECT.

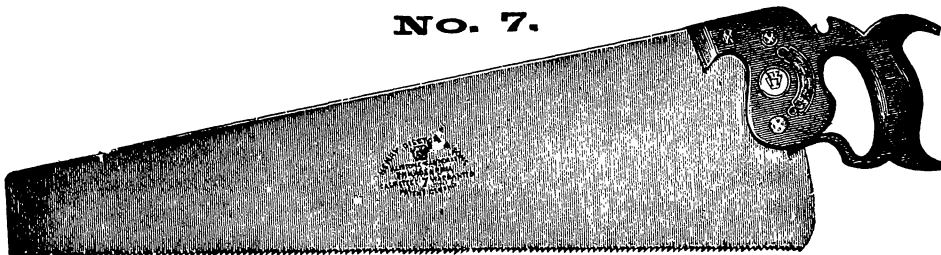
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No. 12.



DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

No. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

"POCKET
EDITION
OF
THE
SAWYER"
and
"LUMBER-
MAN'S
HAND
BOOK,"
Sent
Free
on
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of
Name
and
Post Office
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(INCORPORATED),

Keystone Saw. Tool, Steel and File Works, Philadelphia, Pa.

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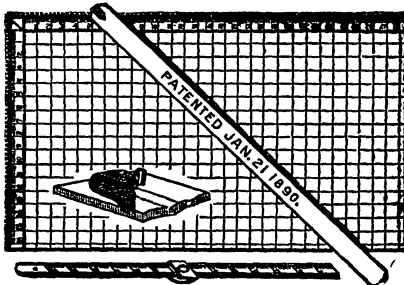
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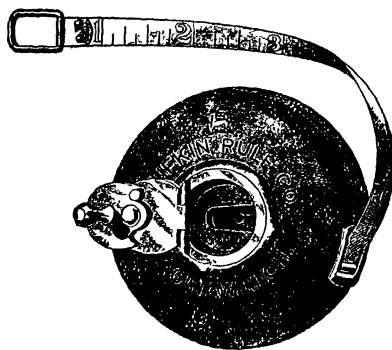
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From 3 inches up to 48 inches, Segments, Gothic Shapes, &c.

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Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval.

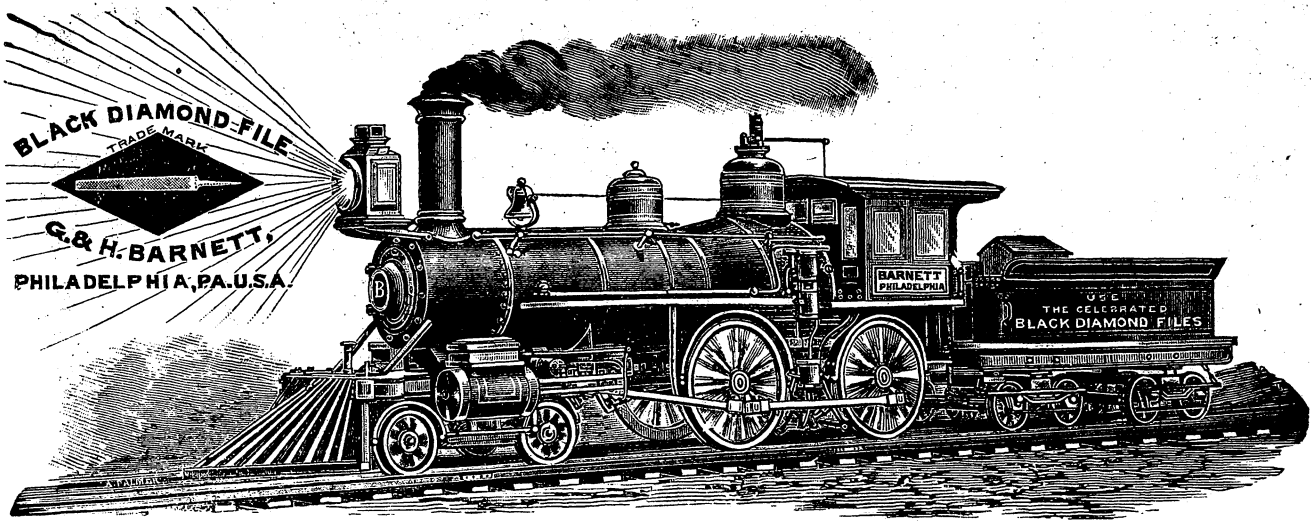
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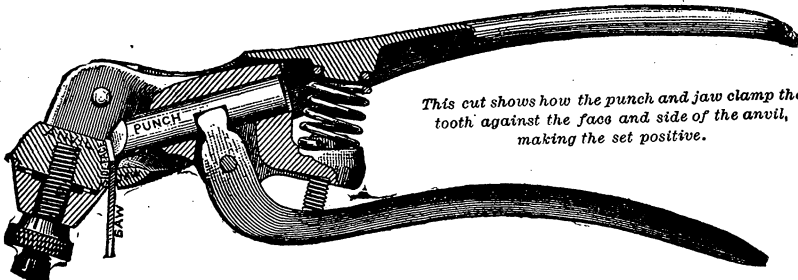
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This cut shows how the punch and jaw clamp the tooth against the face and side of the anvil, making the set positive.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

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DEAR SIR:—Have tried your Saw Set, and find it the *best* in every particular and have used a *great many* different kinds for *twenty years*.
Yours, etc., F. W. SPEARMAN, No. 75 Rutland St., Boston.

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Adjustable Socket Wrenches and Breast Drills.

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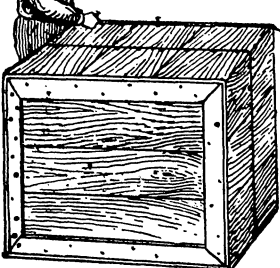
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Adjustable
Socket Wrench.

Lightning Band for Cases and Crates.

(COVERED BY U. S. LETTERS PATENT.)



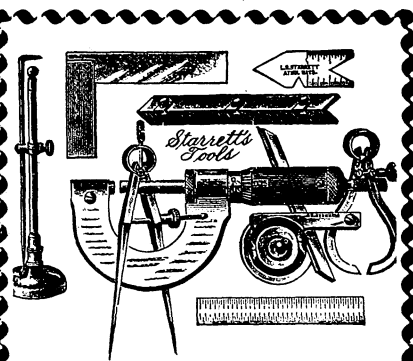
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Pliers for cutting wire, 50 cents extra.
No. 1 for cases under 800 or 400 pounds, and No. 2 for all heavier cases.

Buffalo Specialty Mfg. Co.
Sole Manufacturers,
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MANUFACTURERS OF
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Factory and Salesroom,
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Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.

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Knives or Razors,

SEND TO
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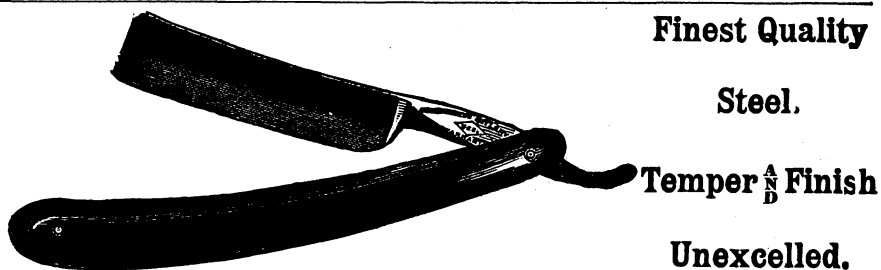
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"WHAT?"

Our New Catalogue.

"HAVEN'T SEEN IT?"

THEN SEND FOR IT.
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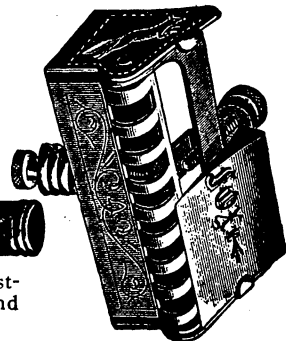
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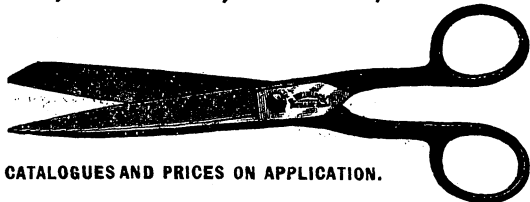
Incorporated 1892.

R. HEINISCH'S SONS CO.,

NEWARK, N. J., U. S. A.

New York office, No. 90 Chambers St.

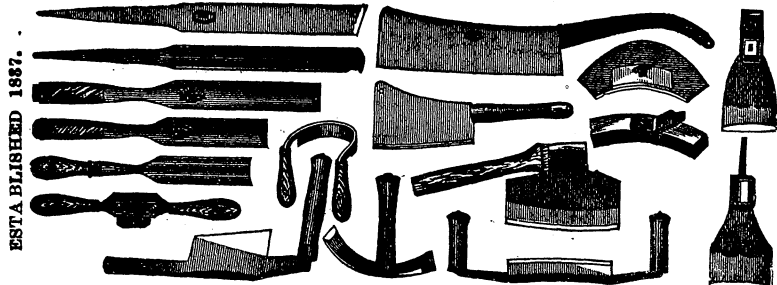
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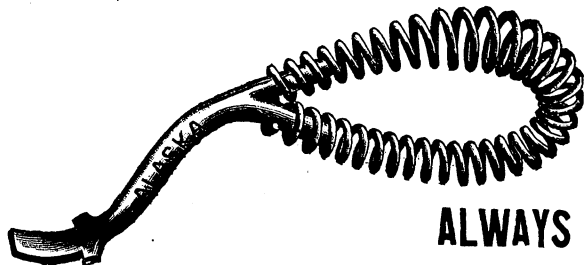
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of highest grade and sell at proper prices.

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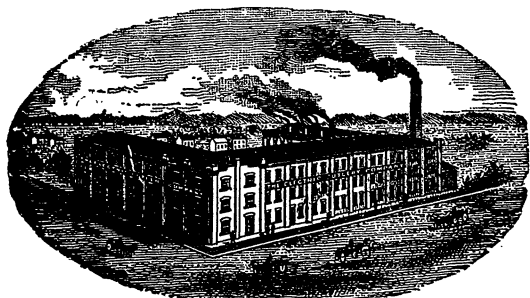
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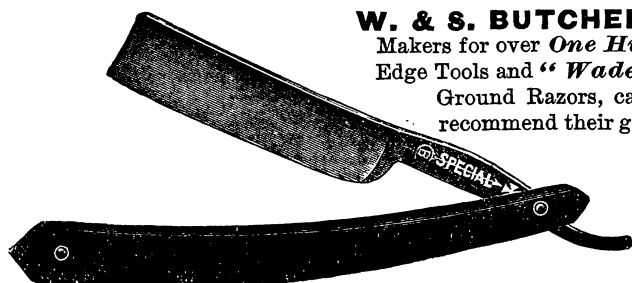
122 Chambers

Street.

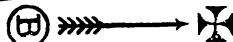
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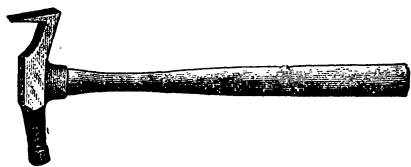


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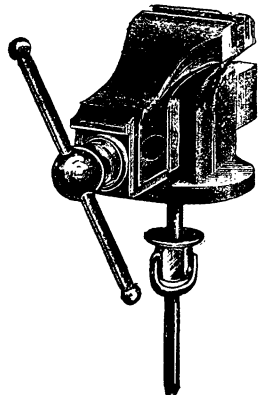


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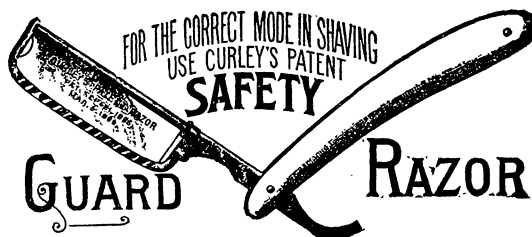
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This is a perfectly balanced Hammer with
Claw of peculiar construction. When tacks
driven closely to base-board are to be removed
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A. FIELD & CO., New York City Agents.
BUEHLER, BONBRIGHT & CO., Agents, Phila-
delphia, Pa.HOLLANDS'
OFFSET JAW
VISE.

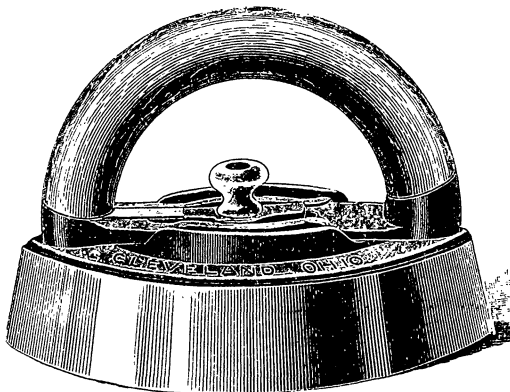
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for drill press work
where chucks can-
not be used and
equally good for
special or regular
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THIS improvement
permits CORRECT
SHAVING, therefore no
irritation is caused, and
the most inexperienced
can shave with perfect
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Elegantly finished in
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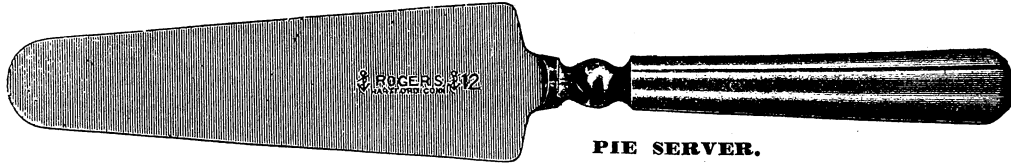
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THAN THE



SILVER PLATED WARE.



PIE SERVER.

MANUFACTURED BY

THE WM. ROGERS MFG. CO.,

Office and Factory, HARTFORD, CONN. P. O. Drawer 30.

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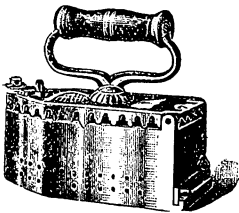


SHALL WE SEND IT? Drop us a card saying "SEND IT." Correspondence Solicited.

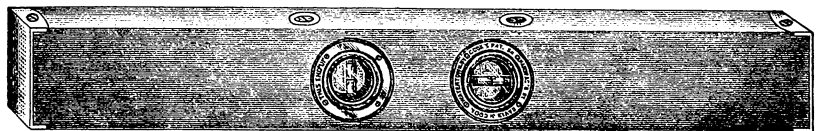
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Bridgeport, Conn.

THE
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Made in Wood and Iron. Every Level Fully Guaranteed.

Inquire at your nearest hardware store for them. If not in stock, send to

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Cut Worm Cork-Screws
for the Bag Cork Puller



FIG. 3. Showing cork-screw and fulcrum in position to pull cork.

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THEIR MAKE IS EQUAL
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HAVE BEEN IN BUSINESS SINCE 1840.

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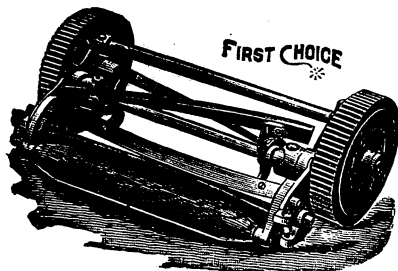
SURPLESS, DUNN & ALDER,

— INCORPORATED, —

Nos. 97 Chambers and 79 Reade Streets, New York.

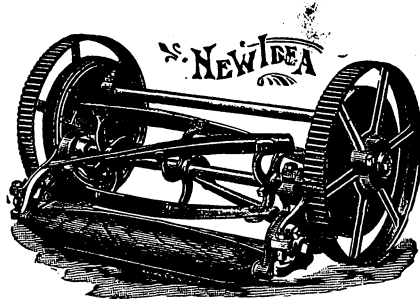
Representing only Leading American Hardware Manufacturers.

LAWN MOWERS.



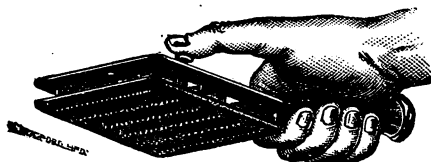
Both our Low and High Wheel Mowers have the right and left hand adjusting screw. Reel shaft runs in box, where all wear can be taken up.

Every machine guaranteed.

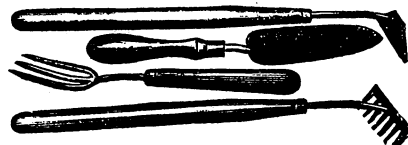


A full line of Boys' Garden Sets, Floral Sets Kitchen Hardware and Hardware for Children's Carriages.

Sole makers of the celebrated "Maud S." Self-Cleaning Curry Comb.



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Send for full Catalogue and Prices.



The Bridgeport Chain Co.'s Triumph

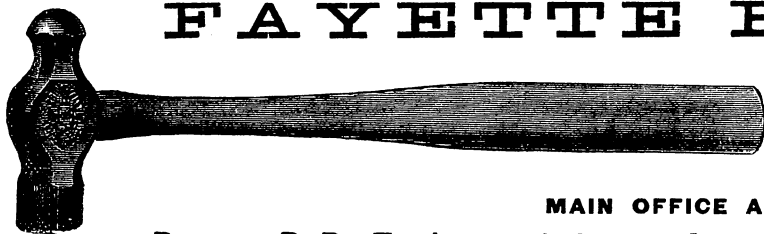
Chain, made into Halters Traces, Cow Ties, Tie-

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The cut represents the exact size of 6/0.

Thirteen Sizes made, 6/0 being the Largest.

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Edge Tools, Railroad, Hammers, Miners' Sledges. B.S. Tools.

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but it is a very difficult task. SOME OF OUR FRIENDS say our "ads." DO US AN INJUSTICE, as we, having a first-class line of goods, should be MORE DIGNIFIED in our methods of advertising. We will try. WE DESIRE TO PRESENT to your notice our line of braces, consisting of 19 DIFFERENT STYLES OR NUMBERS, several of which are made in sizes ranging from "6 to 14 inches," others "8 to 14 inches" and lowest grades, "8 to 12 inches."

Since WE OBTAINED possession of this plant, we have PERFECTED ALL parts which were defective. Broadened the wearing surfaces, strengthened the ratchets, INSERTED STEEL where formerly malleable iron, and now can furnish you with an entire line of braces, which we will guarantee very much superior to those produced by our predecessors and equal in every respect to any braces in the market.

We assure you, we will appreciate your orders. We will furnish you with goods of such satisfactory quality, give your commands such prompt attention and treat you with such business courtesy, that you will feel warranted in continually extending the line of our braces which you now carry. As it is possible you may not have our latest price-list, we will be greatly pleased to mail same on application. If you have never handled our wares, we will thank you for a sample order, or favor us with your address, that we may instruct our representative to call on you with samples. We take this opportunity to THANK OUR FRIENDS for their liberal patronage and will spare no effort to merit the confidence reposed in us.

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A. S. HENN & CO.,

Manufacturers of

Hardware Specialties, Can Openers, Pocket Wrenches, Mincing Knives, Clothes Line Pulleys, &c.

Send for Catalogue.

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DRIVE IT

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Instantly—the screw, we mean, with the **HOWARD-ALLARD SCREW DRIVER**. Original Patent Spiral Clutch Triple Bit. Quality High, Price Moderate. Two Sizes, each packed in a durable box, and filled with Three Sizes Bits. You press forward on Handle, the Spiral turns the Screw. Get the Original "ALLARD" from your Jobber, or write us for Circular and Prices.

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This GUN has rebounding locks and the barrels can be taken off and put on again without cocking the arm, and when cocked the hammers may be let down gradually, and without the full force of the blow. It is simple in construction, having very many less pieces than any other hammerless gun.

Easily Tipped and Cocked,
Damascus Barrels,
Handsomely Engraved,
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PRICE VERY LOW.

A Triumph in Small Bore Rifles. STEVENS' "FAVORITE" RIFLE.

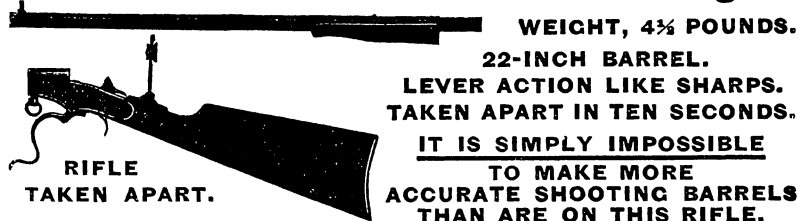


10 SHOTS AT 40 FEET. 10 SHOTS AT 40 FEET. 10 SHOTS AT 40 FEET.

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ABOVE TARGETS
ARE
ACTUAL SIZE.

Made for the 22 or 25 Rim Fire Cartridge.



WEIGHT, 4 3/4 POUNDS.

22-INCH BARREL.
LEVER ACTION LIKE SHARPS.
TAKEN APART IN TEN SECONDS.

IT IS SIMPLY IMPOSSIBLE
TO MAKE MORE
ACCURATE SHOOTING BARRELS
THAN ARE ON THIS RIFLE.

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A 60 Page Catalog showing our full line of Fire Arms with TRADE PRICE LIST sent with pleasure to all dealers.

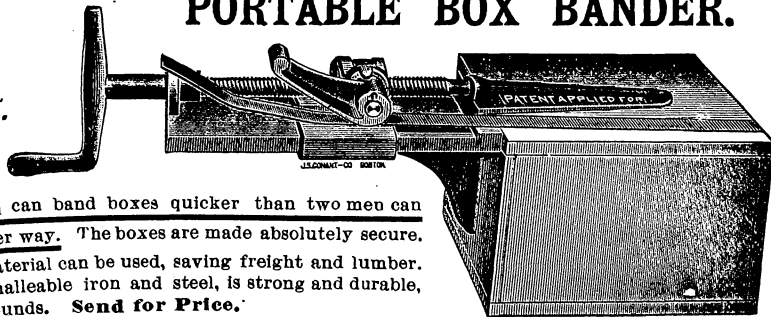
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P. O. Box 5729.

Chicopee Falls, Mass., U. S. A.

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PAYS
FOR
ITSELF.

PORTABLE BOX BANDER.



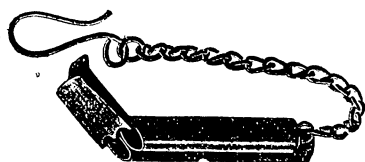
One man can band boxes quicker than two men can in any other way. The boxes are made absolutely secure. Lighter material can be used, saving freight and lumber. Made of malleable iron and steel, is strong and durable, weighs 8 pounds. Send for Price.

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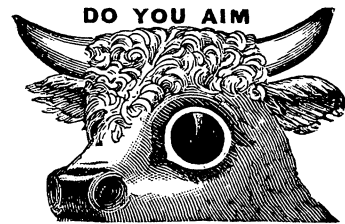
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Each whistle has a chain with hook for buttonhole. Sample sent for 25 cents. Send for our list of sundries. Sold by all bicycle and hardware dealers.

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In Your Business or at the Range?

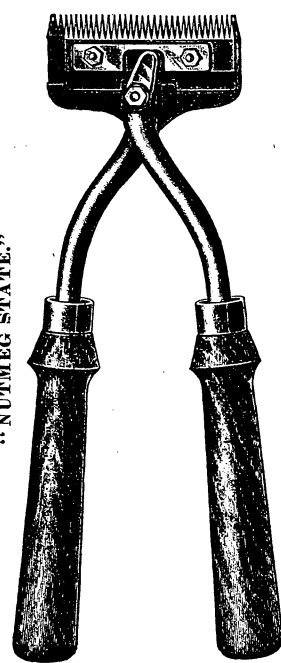
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IDEAL MFG. CO., New Haven, Ct., U. S. A.

Please mention The Iron Age when you write.

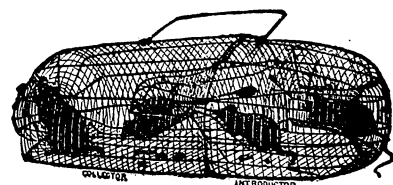
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MANUFACTURER OF HARDWARE,
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GENUINE **MARTY** RAT AND MOUSE TRAPS
ALWAYS IN STOCK.



THEY DO THE WORK.
Orders solicited. Prices on application.
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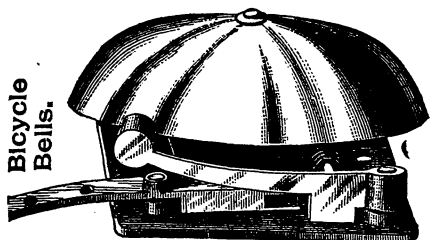
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Manufacturers of
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Buy the Best.

"VASSAR"
CYLINDER
LOCKS

FOR
FRONT DOORS,
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FINE
BRONZE
GOODS
IN MANY
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PURE MANILA AND SISAL

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MANILA, SISAL AND MIXED

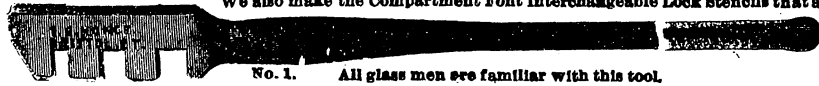
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Mexican Hammocks, Hammock Attachments, Peerless Sash
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We also make the Compartment Font Interchangeable Lock Stencils that are hav- ing such run.

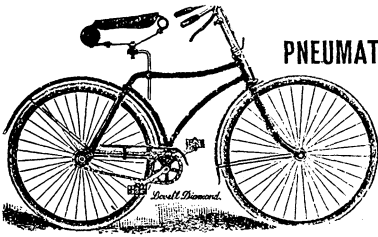


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No. 1. All glass men are familiar with this tool.

BRISTOL, CONN.

Lovell Diamond Cycles



HIGHEST GRADE.
PNEUMATIC, CUSHION AND SOLID TIRES.
FOR LADIES AND GENTLEMEN.
MANUFACTURED BY
John P. Lovell Arms Co.
BOSTON, MASS.
CYCLE CATALOGUE FREE.

Yacht AND Boat Hardware.

L. W. FERDINAND & CO.,
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The **HENRY C. HART MFG. CO.,**
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MANUFACTURERS OF

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Turn your Brains Into Money.

YOU CAN DO IT
BY TAKING AN AGENCY FOR
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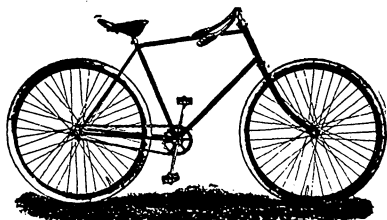
The most Popular and Satisfactory medium grade line of Bicycles in this country. They give no trouble and are thoroughly guaranteed. Fitted with the new Bidwell Constrictive Pneumatic Tire for '93. They are high grade in everything except price. Write to us, we are the sole Eastern Agents, waiting to answer your questions and to quote you liberal discounts.

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308-310 West 59th St., N. Y.

WESTERN WHEEL WORKS.

BICYCLE



MANF'TRS

From \$20

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MOST COMPLETE LINE MADE.

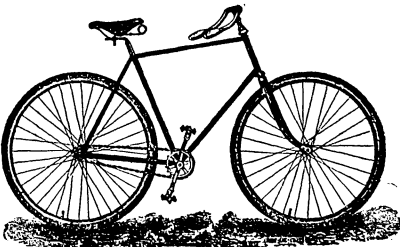
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MONARCH BICYCLES
ARE PERFECTION IN EVERY DETAIL.

FOUR STYLES.

Some makes are older, but none better.



POPULAR WEIGHTS,

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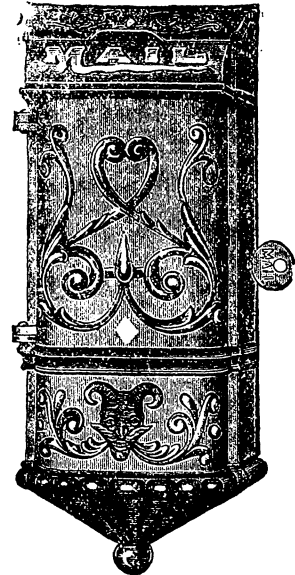
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You can handle **MONARCHES** to advantage in your business. 1893 Catalogue now ready. Send for it.

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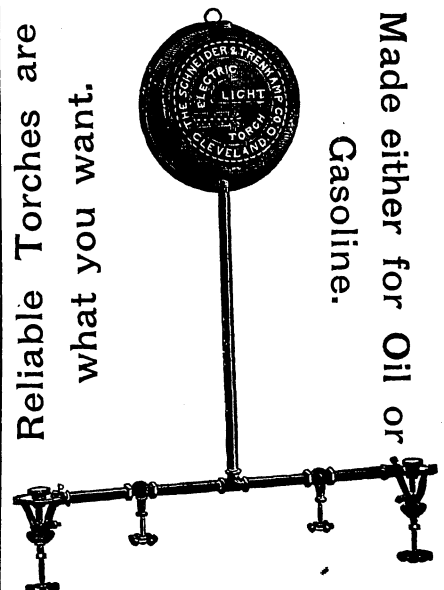
42, 44, 46, 48, 50 and 52 N. Halsted St.,
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Send for Catalogue and Prices.



Full Line of Mail Boxes.

Reliable Torches are what you want.

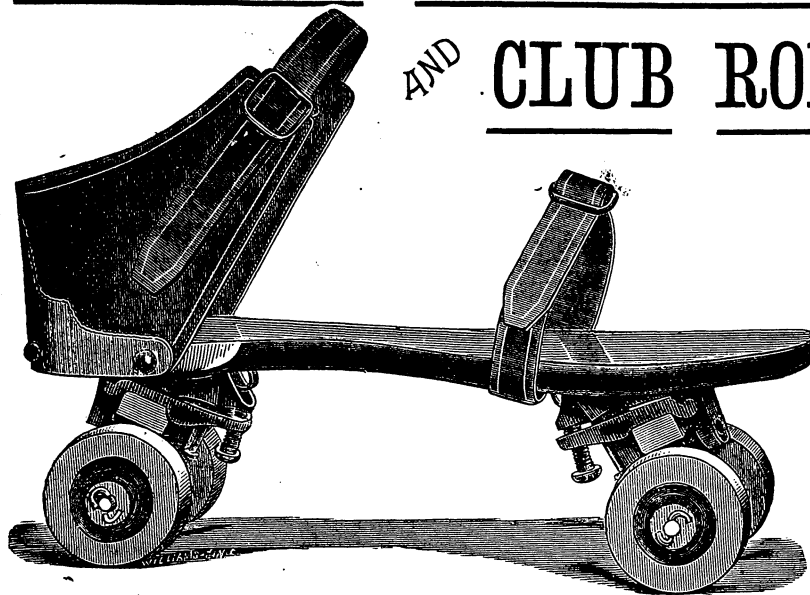


Made either for Oil or Gasoline.

These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by
THE SCHNEIDER & TRENKAMP CO.,
Nos. 479 to 497 Case Ave., Cleveland, Ohio.

The New York Safety Dumb Waiter,
"The Manhattan Dumb Waiter,"
"The Improved Humphrey Hand Elevator,"
Made specially to be sold by Hardware Stores. Thousands in use. Catalogues on application.
THE STORM, MANUFACTURING CO.
NEWARK, NEW JERSEY.
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HENLEY'S CELEBRATED RINK AND CLUB ROLLER SKATES.



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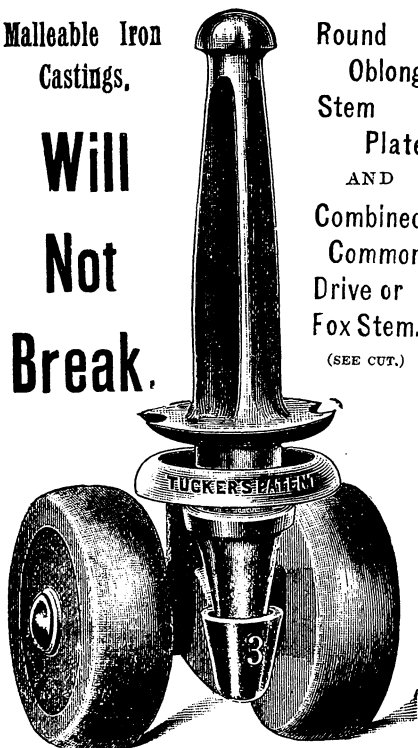
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Malleable Iron
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**Will
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Break.**

Round
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Plate
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Combined
Common
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Fox Stem.
(SEE CUT.)



The most satisfactory Anti-Friction Caster in the market.

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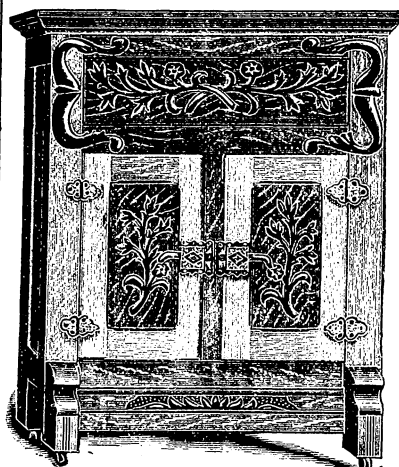
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Porcelain Lined Lemon Squeezers



Best Common Mouse Traps, Steak Hammers, Boot Jacks, Lap Beards, Beacon Hill Pat. Mouse Traps, Mallets, Bung Starters, Hand Screws.
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KANKAKEE REFRIGERATORS

Solid Oak, Dry Air, Non-Conductor Filling.

NEW DESIGNS, RAISED HAND CARVINGS,
SOLID BRONZE TRIMMINGS, LEVER
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HINGED BASEBOARD.

We want a live dealer in every town to push their sale. Send for catalogue and special prices. Costs nothing to investigate.

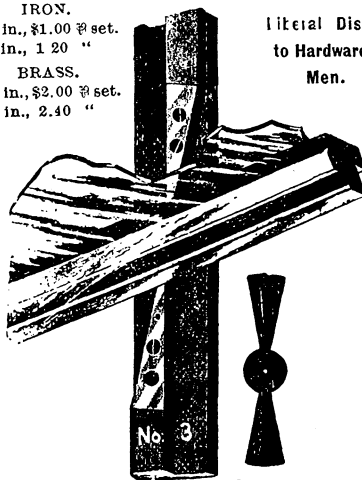
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CHICAGO, 268 WABASH AVE.

HOWARTH REVERSIBLE SASH AND SASH CENTRE CO., DETROIT, MICH.

IRON.
1 3/4 in., \$1.00 per set.
2 1/4 in., 1.20 "
BRASS.
1 3/4 in., \$2.00 per set.
2 1/4 in., 2.40 "

Literal Discount
to Hardware
Men.



This sash centre is made of malleable iron or brass, it has the displacement between rebates, is easy to apply, and allows the sash to be turned outside in for cleaning. Can be used top and bottom or sides.

Refrigerators.



The FAMOUS
**Leonard
Cleanable**
Excels All Others.
New Designs,
More Selling
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CHALLENGE CORN PLANTER CO.

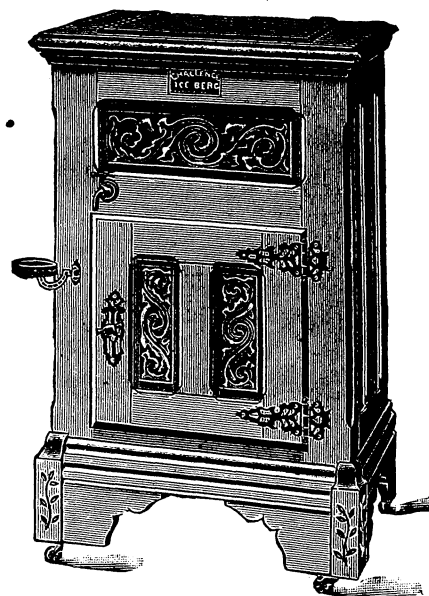
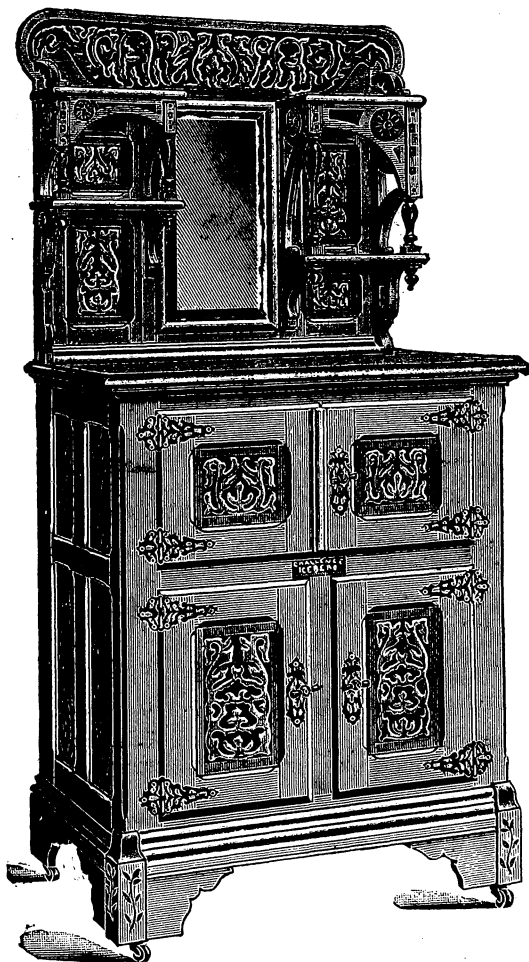
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The Largest Factory of its Kind in the World.

Write for prices, and for illustrated seventy-six page catalogue.

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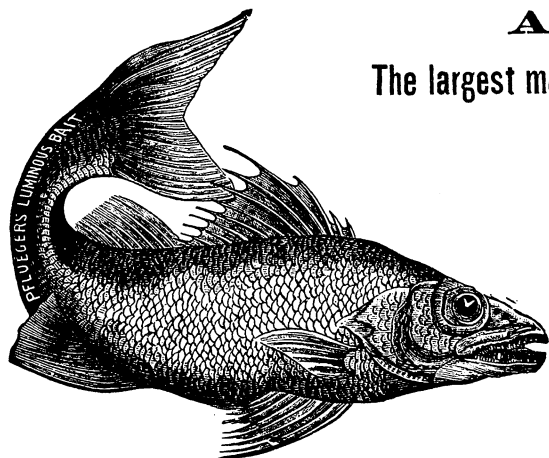
The largest manufacturers of Fishing Baits and Anglers' Specialties in
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EXCLUSIVELY MANUFACTURERS

Trolling Spoons, Spinners, Phantom Minnows, Hard and Soft Rubber Minnows, Frogs, Crawfish, Grasshoppers, Insects, Artificial Flies, Snell Hooks, Furnished Lines, Sinkers, Floats, Fly Cream, Fish Stringers, and many other new goods too numerous to mention.

(With "LUMINOUS BAIT" you catch Fish while with others you might.)

Please mention *The Iron Age*.



HOW TO KEEP A STORE.

By S. H. TERRY.

406 PAGES, 5x7 ½ INCHES.

This book should be in the hands of every one interested in the selling of goods at retail. Among the subjects discussed are: The selection of a business; choice of a locality; buying a stock of goods; examining, marking and arranging goods; how to advertise; employment of clerks; selling for cash and credit; keeping accounts; expenses; copartnerships; losses by fire, theft, &c.; influences of social life on business; buying at auction; investment of profits; insolvency; business qualifications. Every branch of the retail trade is treated upon in a direct, business-like manner. It is a thoroughly practical book for merchants and clerks. **Price, \$1.50.**

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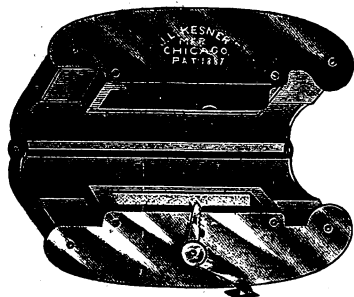
DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.

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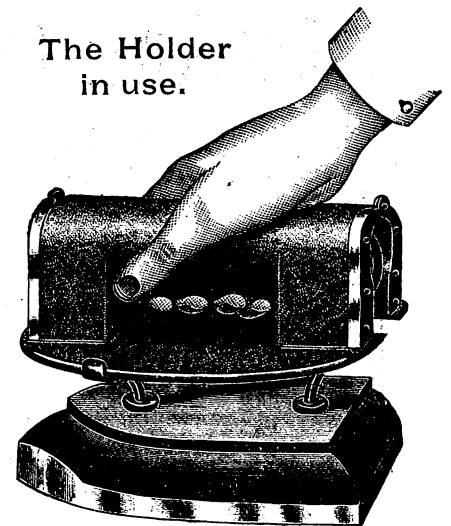
ALWAYS COOL SAD IRON HOLDER.

Indispensable to every Housekeeper and Laundry. Sells at sight and pays the Dealer a Large Profit. They pack closely and ship cheaply. Every Holder Guaranteed to give Absolute Satisfaction.

It is the best and only perfect Iron Holder made. It is strong, durable, unburnable, and will fit the handle of any Sad Iron. It never gets hot—**ALWAYS COOL**—instantly applied and self adjustable. Fastens with spring latch and opens with an automatic spring.



Patented Oct. 25th, 1887, and others pending.



The Holder in use.

It is made on a two part wood frame covered with heavy duck. The inside is lined with asbestos—a positive non conductor of heat. When closed on the handle of the iron an extra heavy nickel plated brass shield prevents the heat from striking the hand.

SOLD BY ALL HARDWARE JOBBERS.

If your jobber does not carry them order a sample gross direct from us. No dealer can afford to be without them.

For Circulars, Testimonials and Price-List write the Manufacturers,

J. L. KESNER & CO.,

76-78 E. Illinois Street, CHICAGO, ILL.

THE IRON AGE STANDARD HARDWARE LISTS

FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

PRICE 25 CENTS.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans and Round Boilers.

Pints.	Plain	Turned.	Tin'd or En'd.
1	\$0.30	.35	.39
1 1/2	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2 1/2	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2 1/2	1.05	1.18	1.56
3	1.20	1.35	1.70

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by 1/4 inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3 1/2 x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Wrenches.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Stove Hollow Ware.

POTS, KETTLES, ETC. (CAST IRON.)						
No.....	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25
Spiders.....	.27	.30	.35	.40	.50	.60
Griddles Round	.22	.25	.27	.30
“ Long..	.40	.50	.60	.75

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0	6.00	5	14.58	
1	6.75	6	16.94	

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

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Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

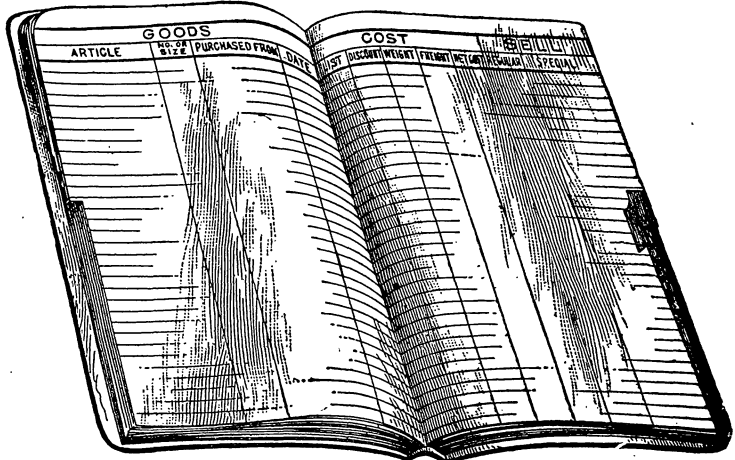
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

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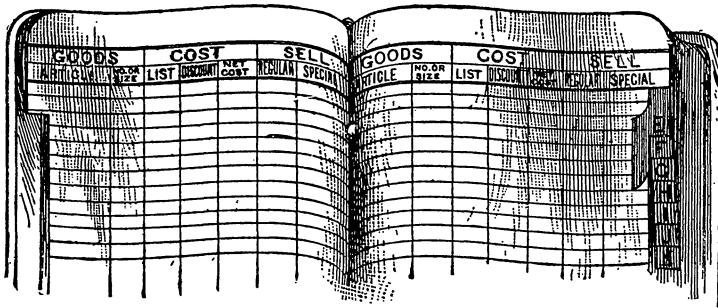
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

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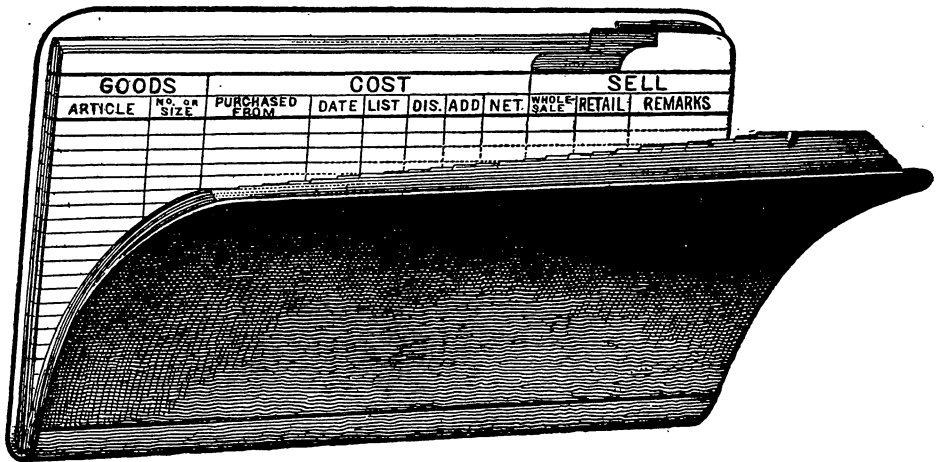
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

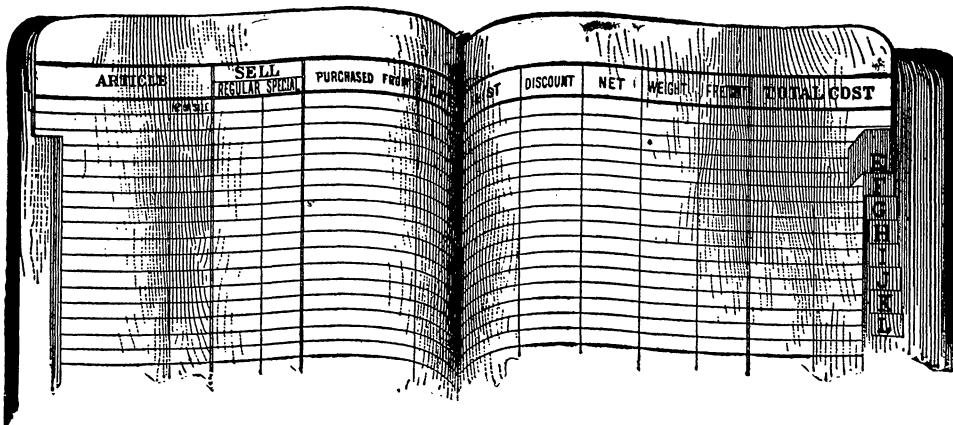
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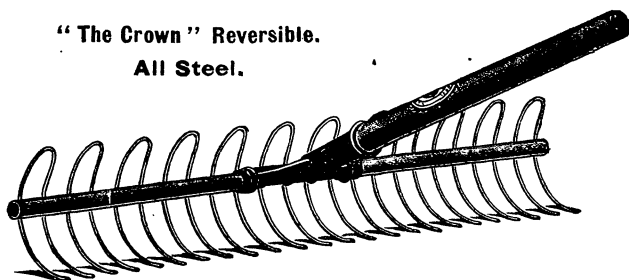
The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This arrangement is adapted to the requirements of the trade in this direction.

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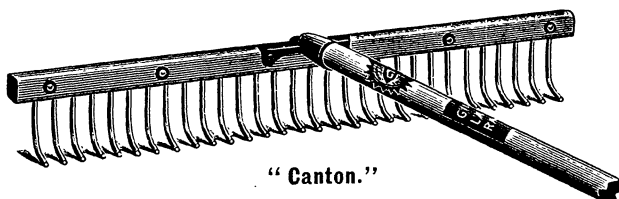
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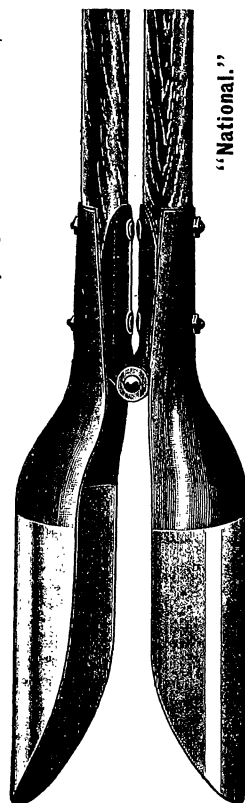
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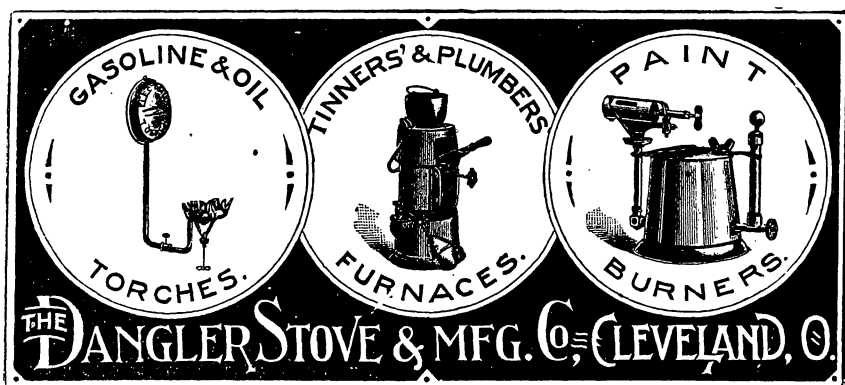
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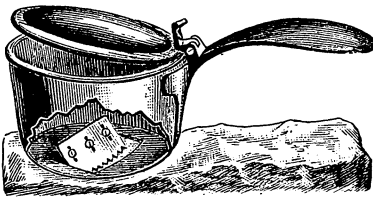
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
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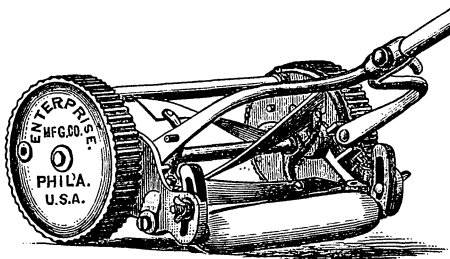
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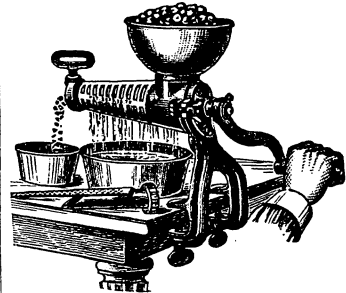
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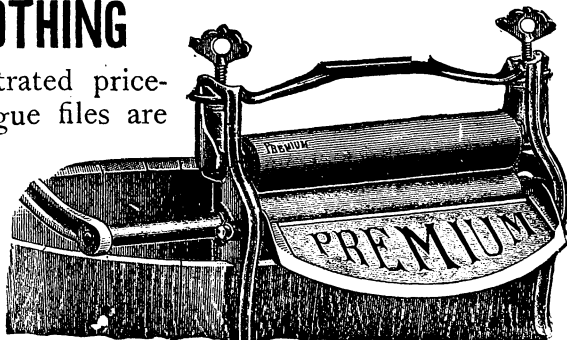
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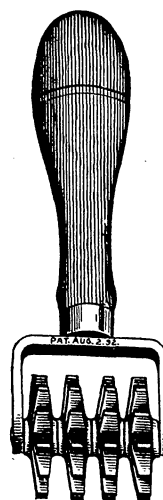
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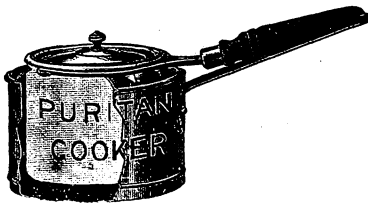
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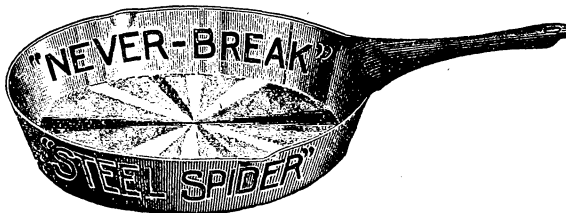
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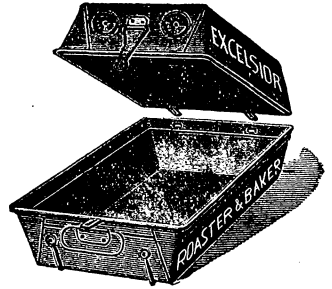
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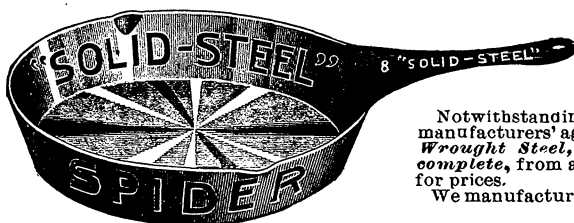
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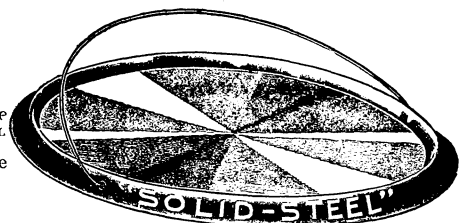
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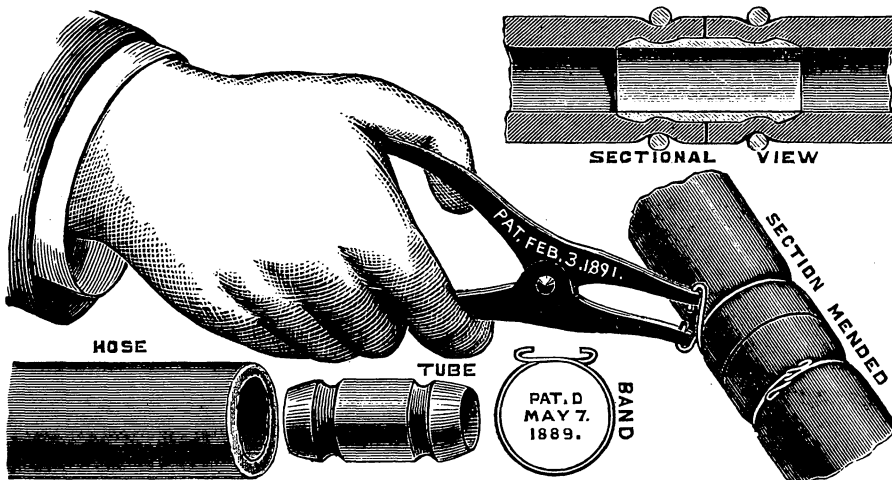


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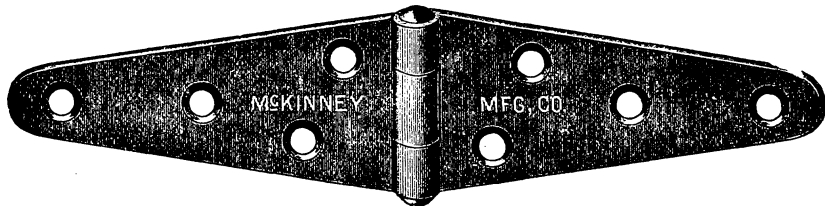
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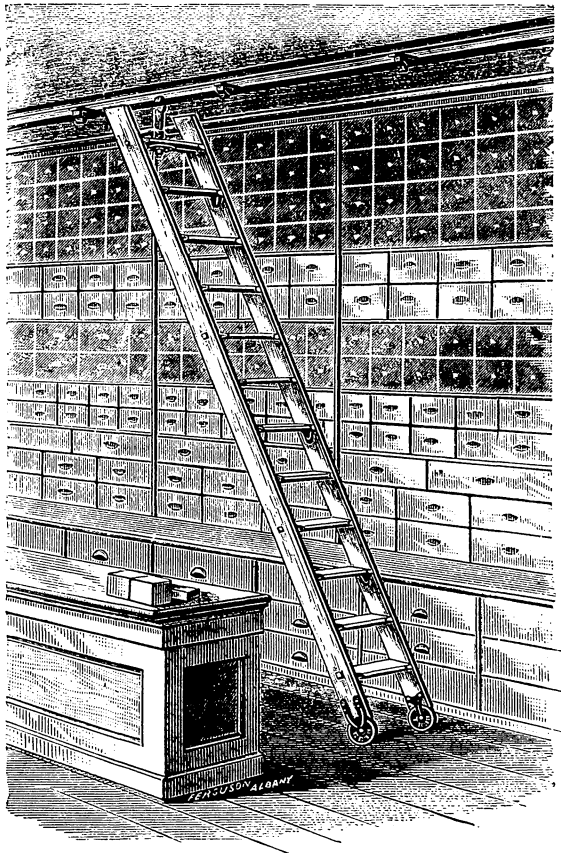
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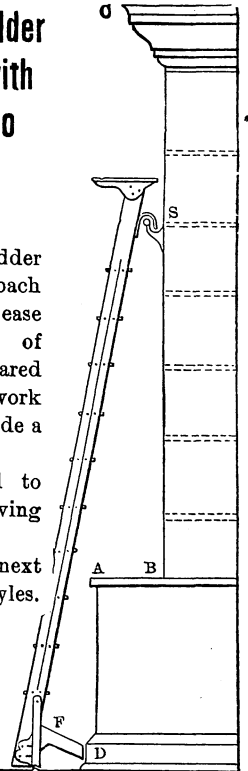
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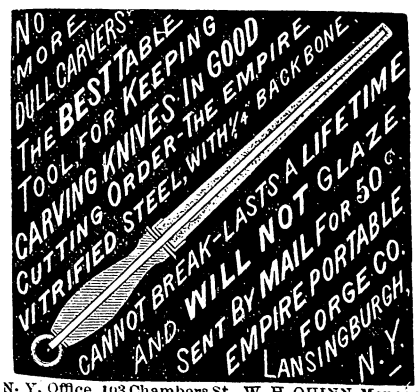
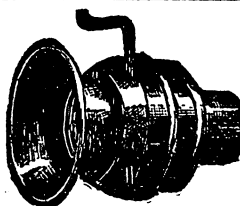
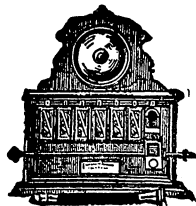
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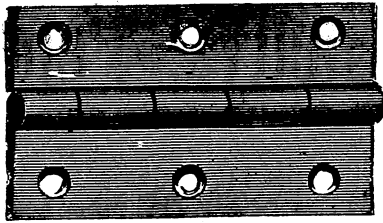
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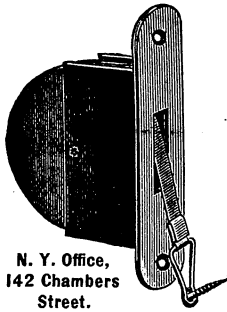
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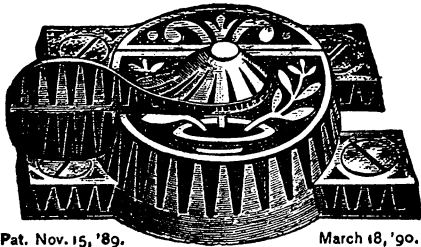
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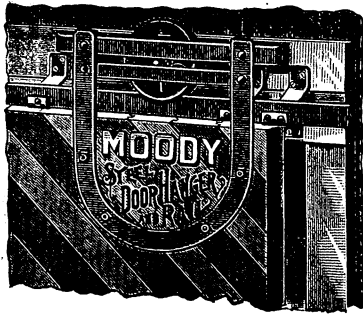
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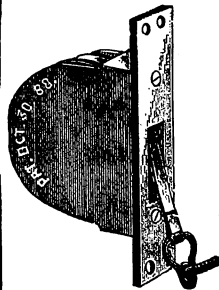
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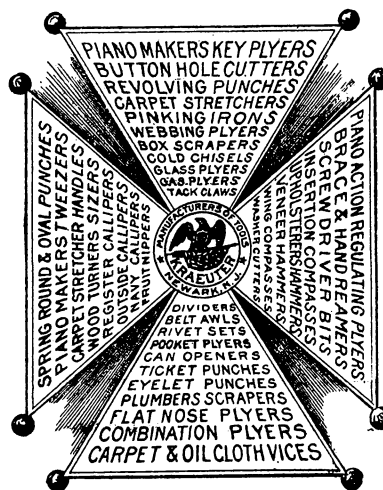
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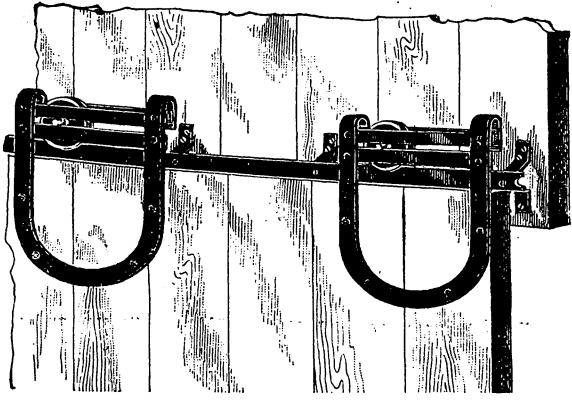
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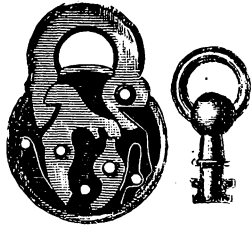
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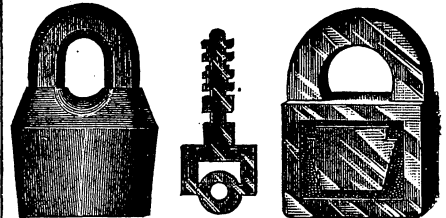


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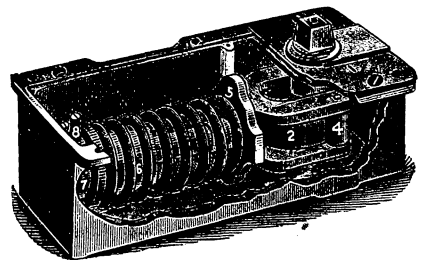
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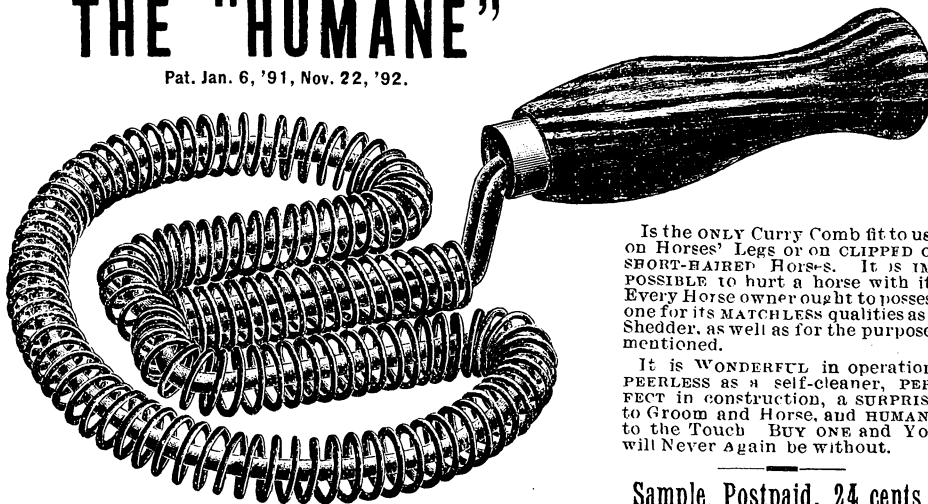
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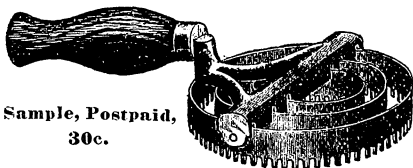
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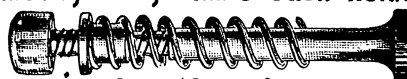
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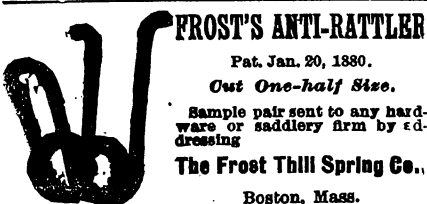
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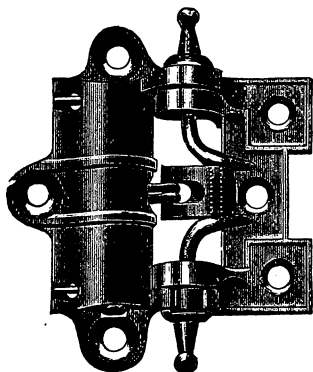
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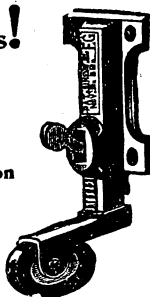
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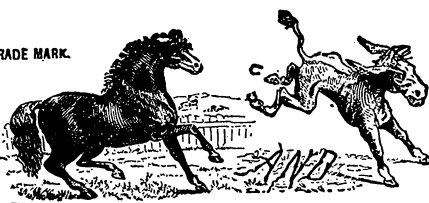


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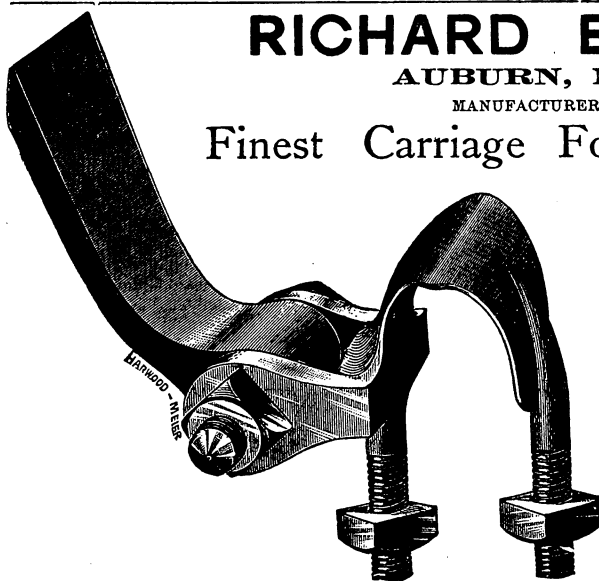
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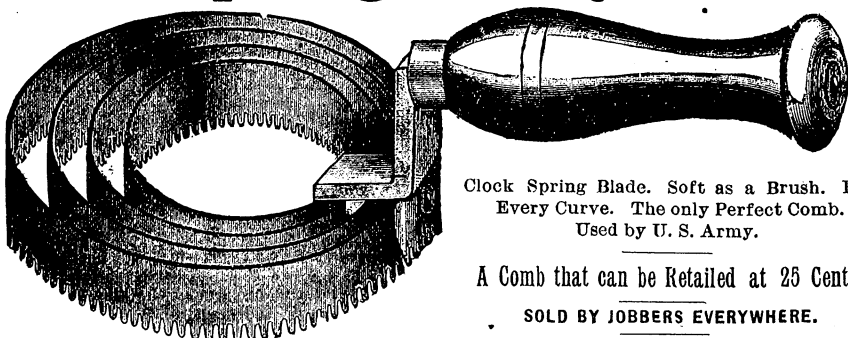
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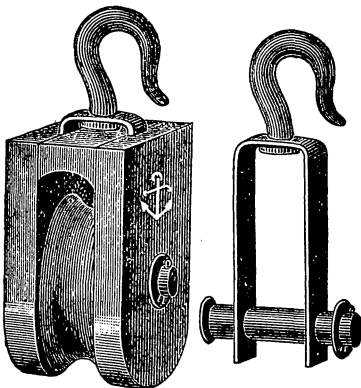
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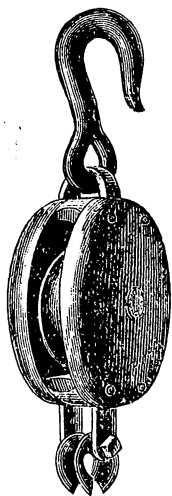
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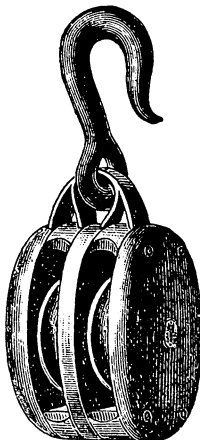


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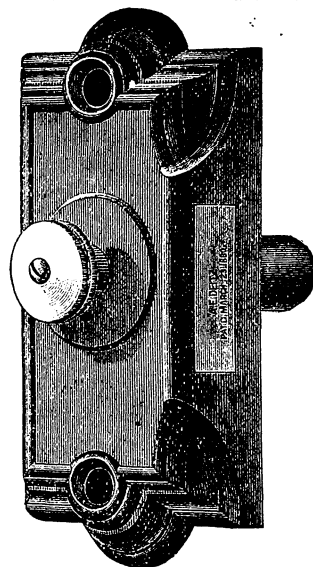


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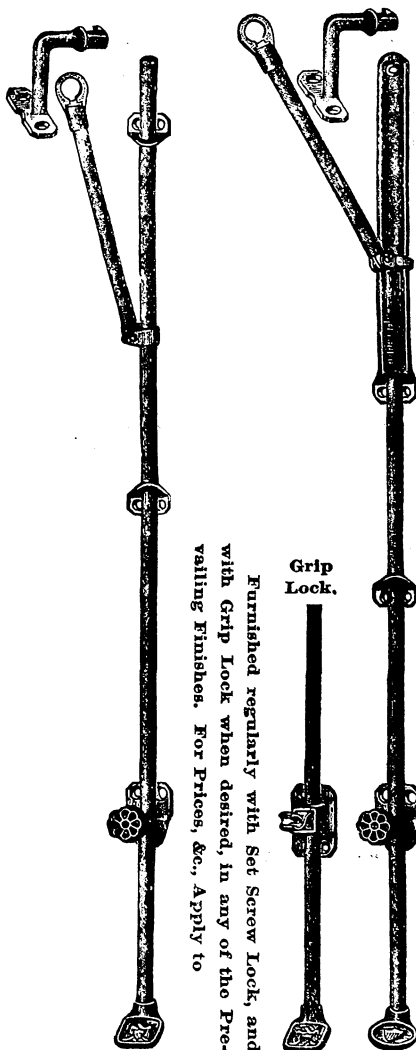
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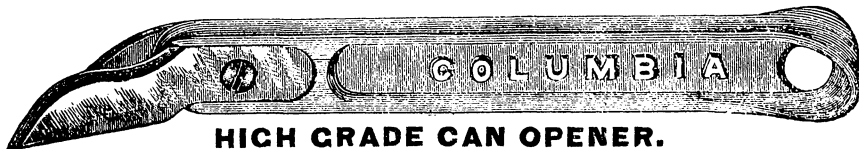
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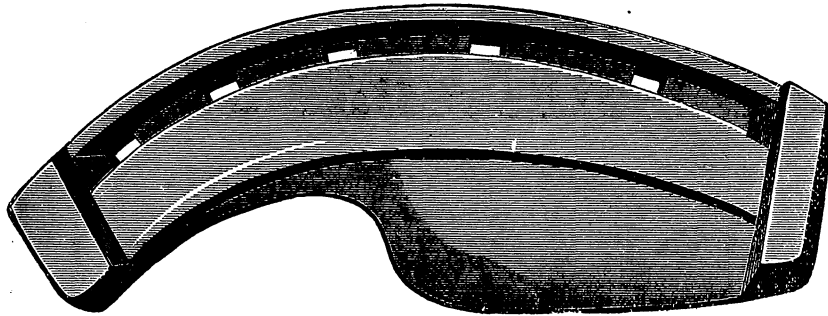
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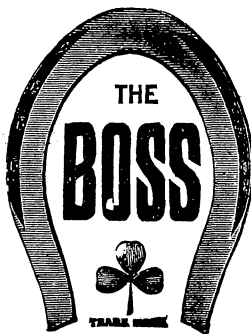
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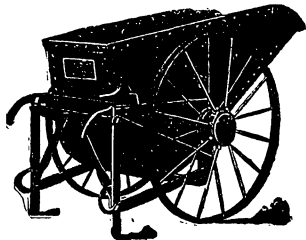
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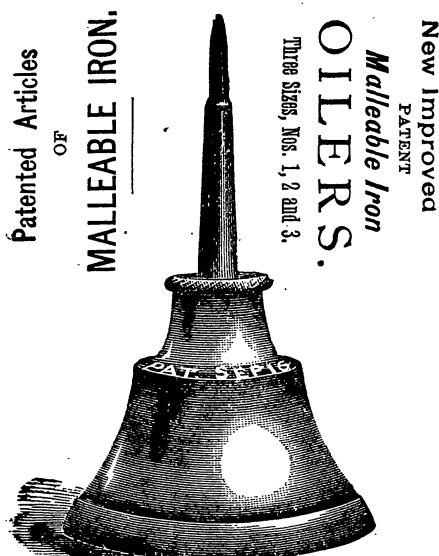
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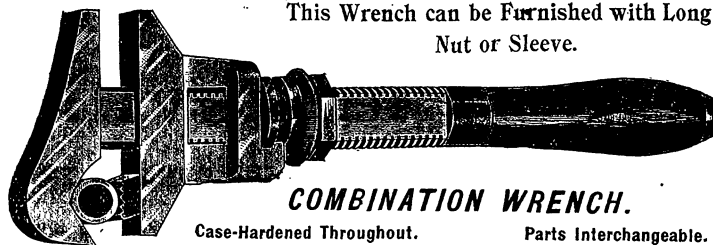
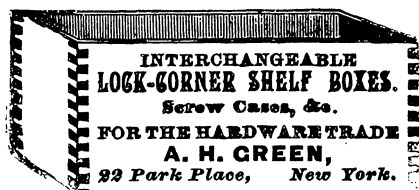
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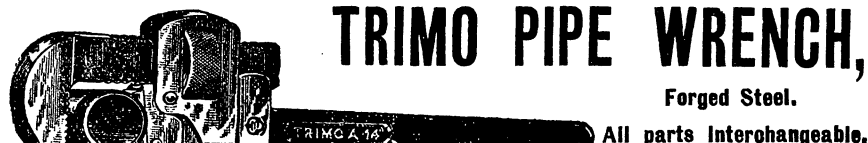
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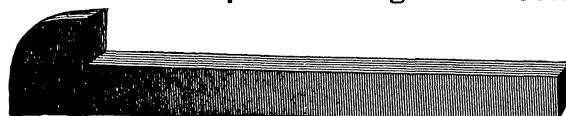


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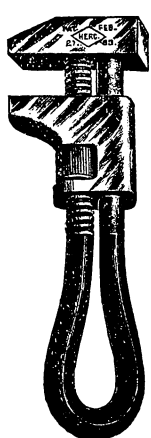
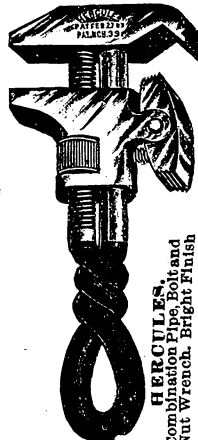
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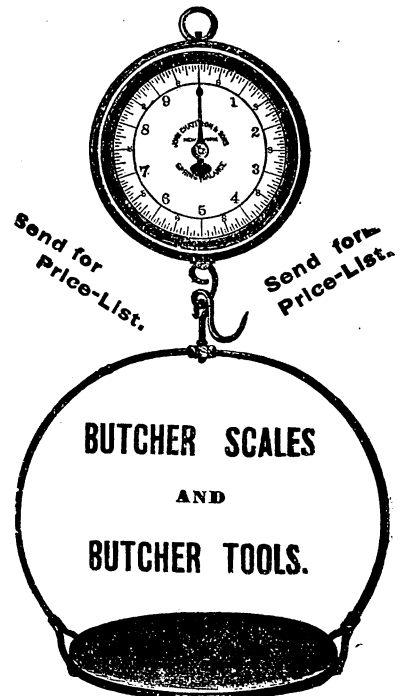
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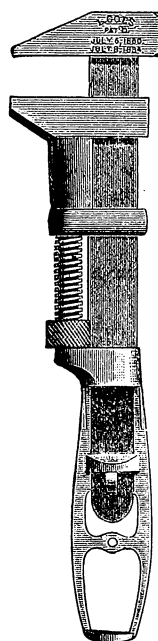
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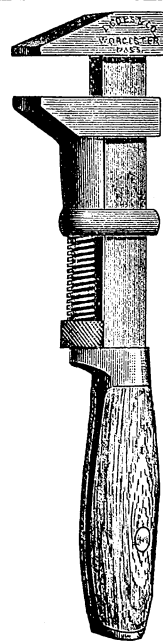
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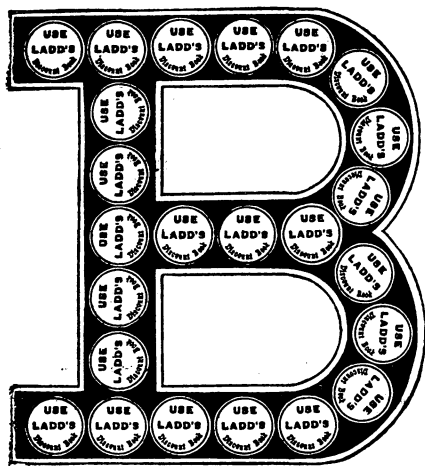
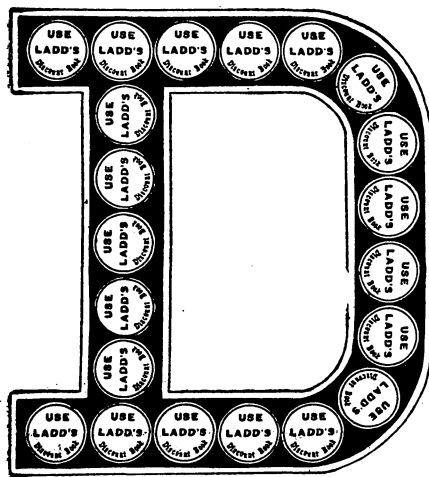
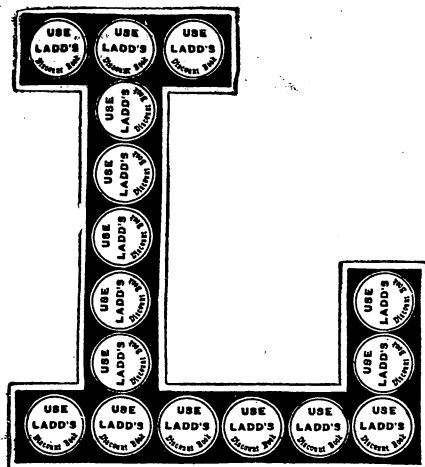
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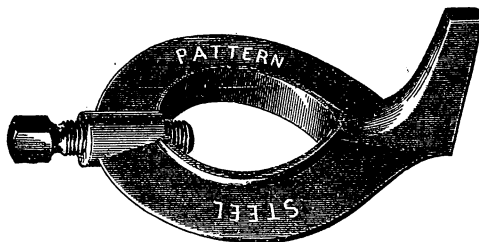
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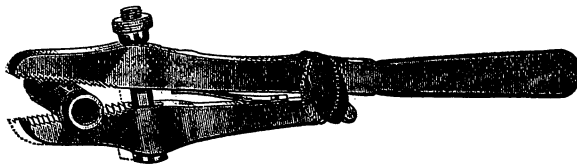
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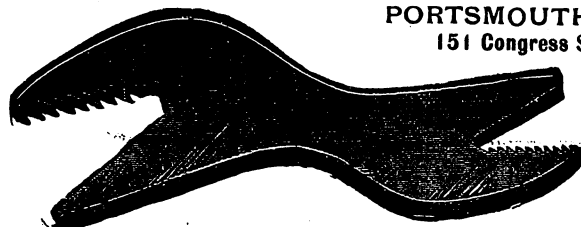
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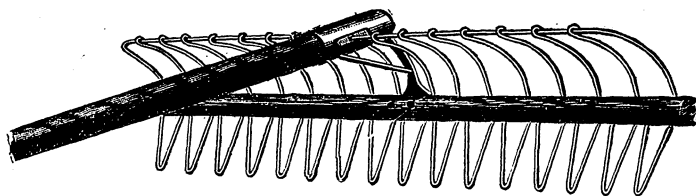
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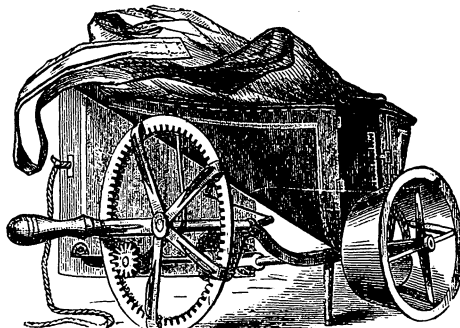
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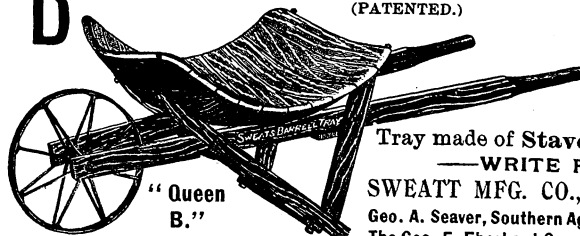
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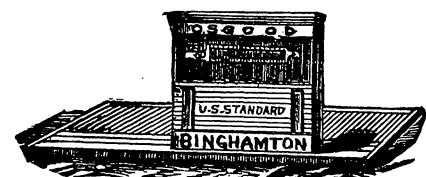
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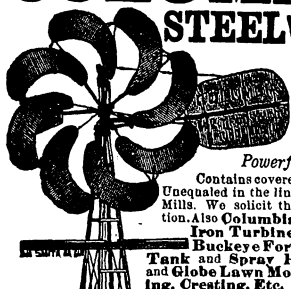
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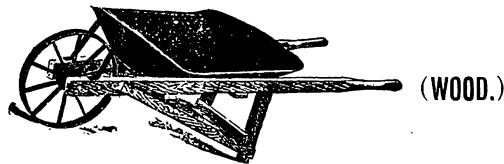
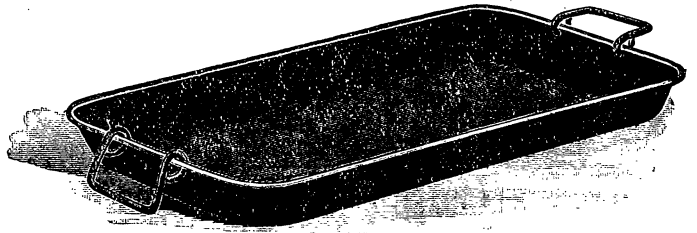


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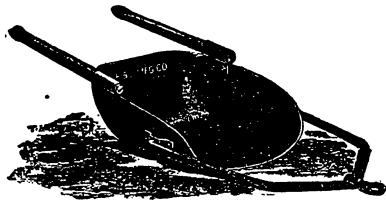
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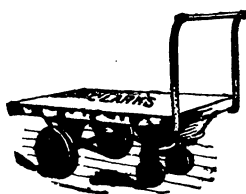
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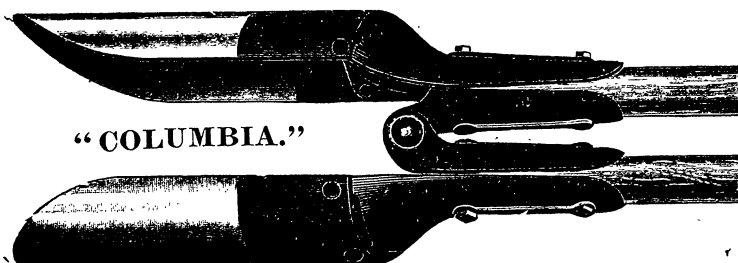
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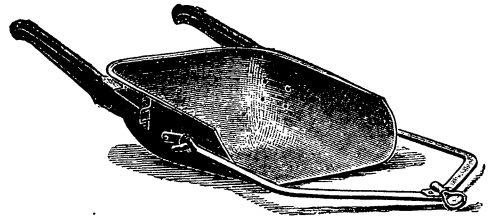


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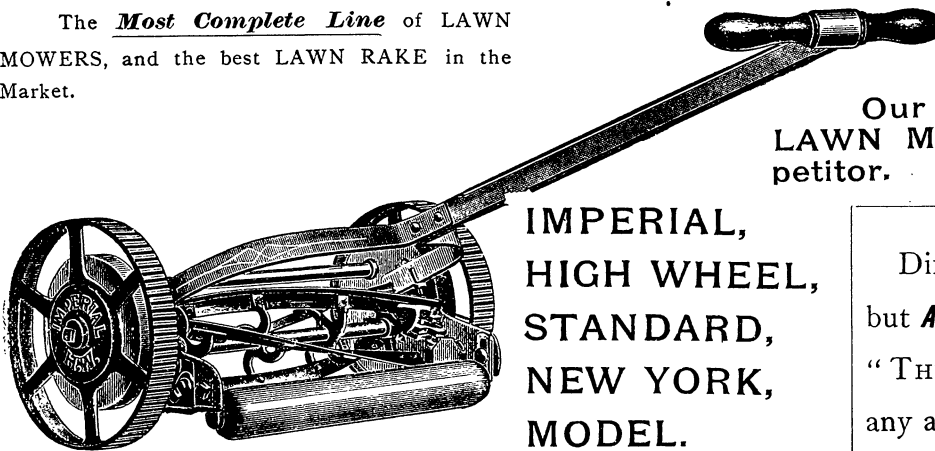


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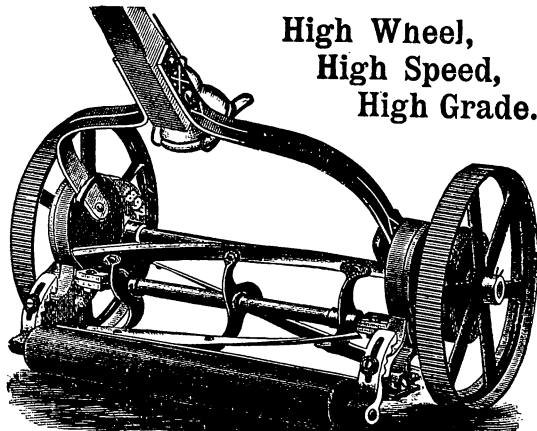
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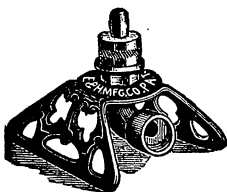
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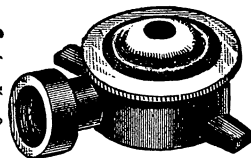


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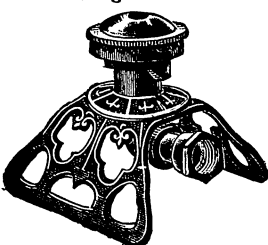


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The only Sprinklers which are adjustable and will give a spray as fine as the mist of Niagara, or as heavy as the area of the supply pipe.

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We also manufacture the old style revolving sprinklers, but for our own use would not have them as a gift.

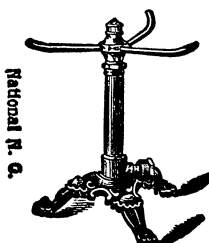


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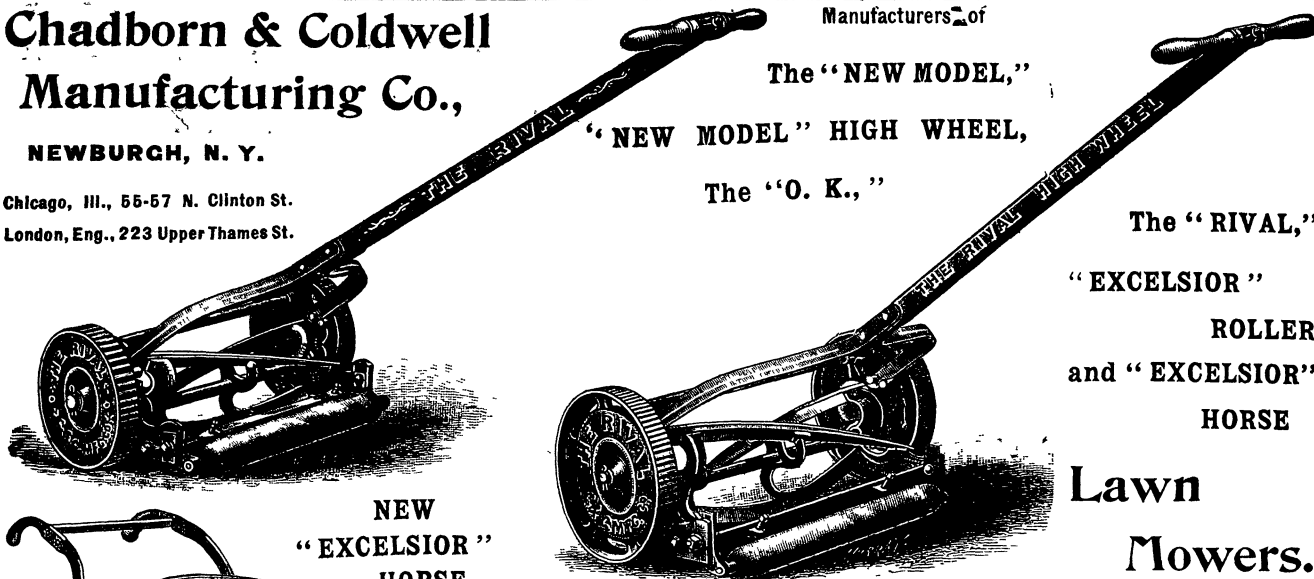
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Lawn Mowers.



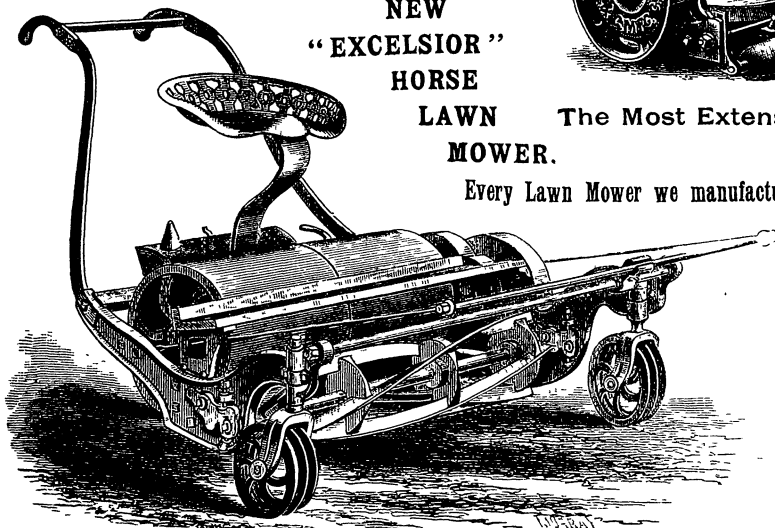
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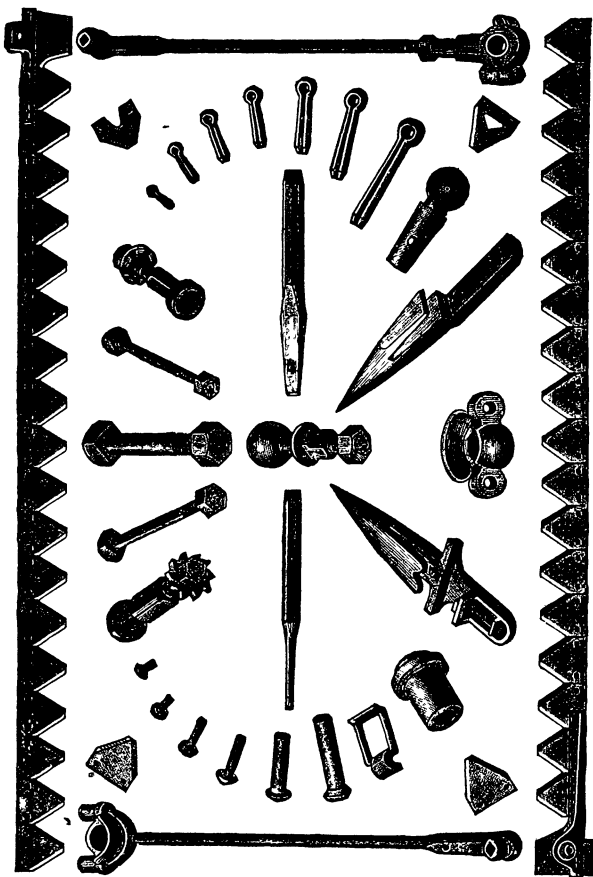
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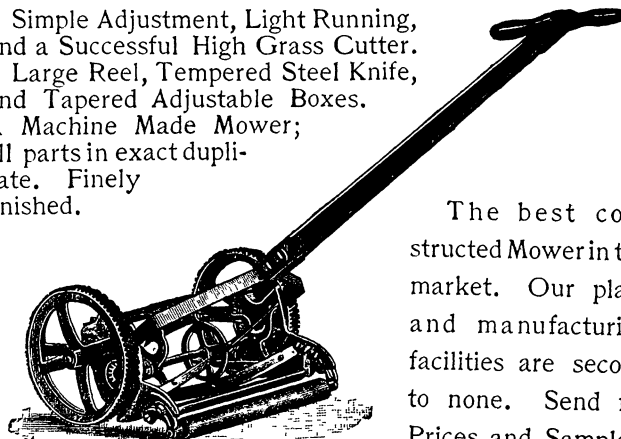
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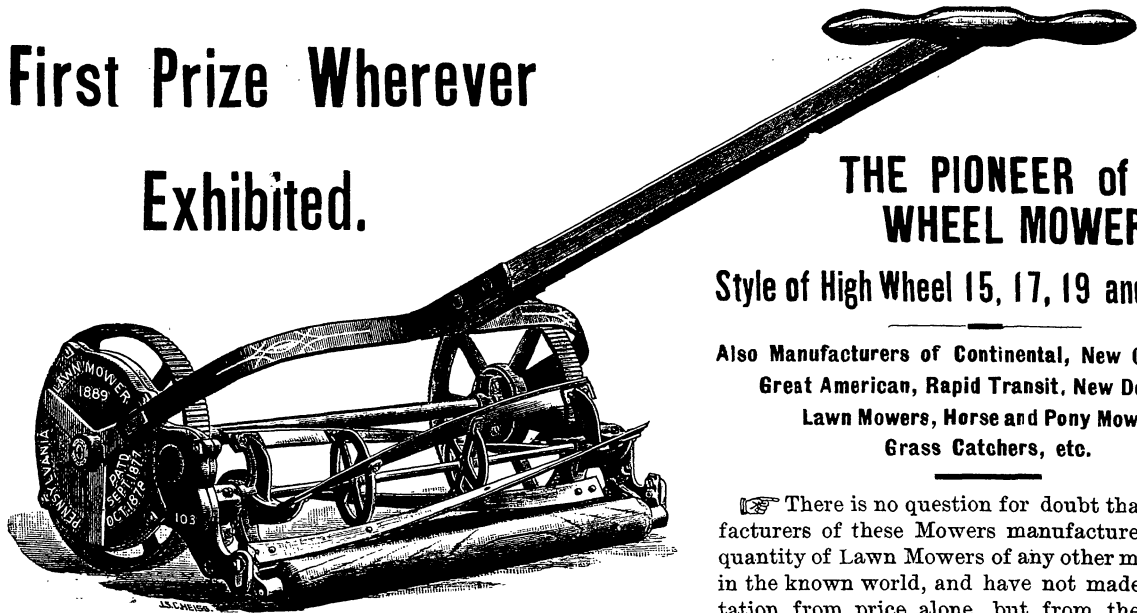
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Style of High Wheel 15, 17, 19 and 21 inch.

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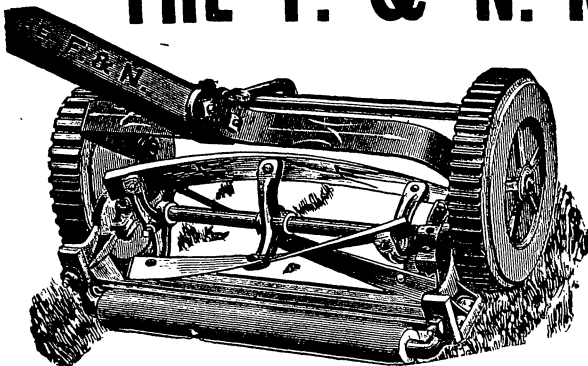
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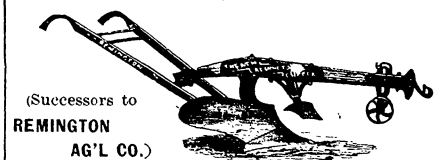


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The F. & N. High Grade Lawn
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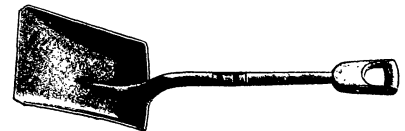
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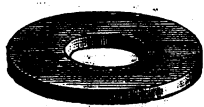
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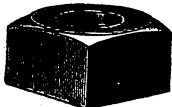
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FLAT
With hole in
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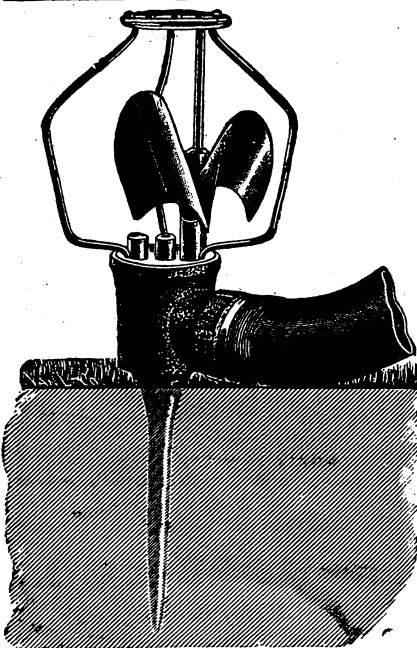
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All Standard Sizes, Regular or Odd, to Order.

In Kegs or Packages, convenient for JOBBERS.



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BONNETTE'S ARC LAWN SPRINKLER.

Patented Oct. 20, 1891.

This Sprinkler was invented by a **DRY GOODS MAN** in Bay City, Mich. He noticed that when his neighbors set out their sprinklers, they wet all over the sidewalks as well as the lawns.

On going back and forth to the store he was often forced into the middle of the street to avoid a shower from the sprinkler. Ladies often ruined their dresses from this source.

It set him to thinking. Sprinklers should not be a nuisance. Could one be made that would sprinkle, if desired, in a half circle? He thought so. He commenced to work and experiment.

That was five years ago. It required lots of patience and there were many disappointments, but to-day,

NOTE THE RESULT.

Five good reasons why this is the best sprinkler to buy:

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2. It will sprinkle a circle from 4 to 40 feet in diameter, according to the water pressure.
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4. This is the only machine ever invented that will sprinkle water in a half-circle, thus preventing the wetting of walks while thoroughly sprinkling the lawn.
5. It can be changed from a circle to a half-circle, or vice versa, in five seconds.

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A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

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It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$3.00; Double Indexed Edition, \$4.00.

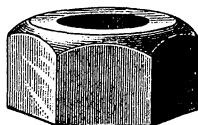
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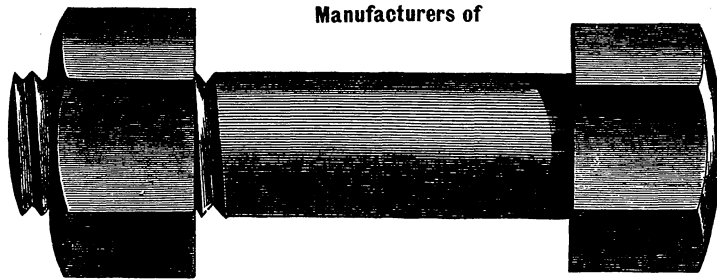
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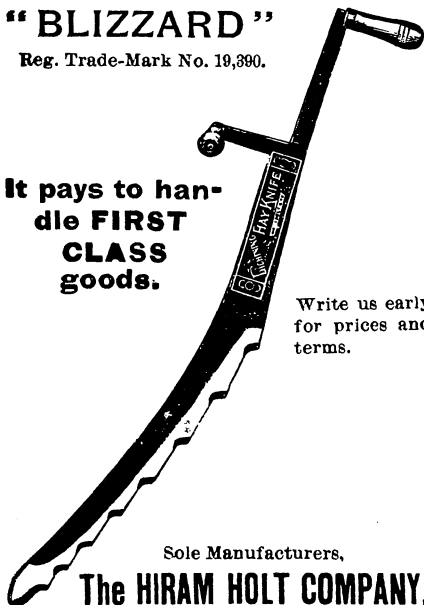
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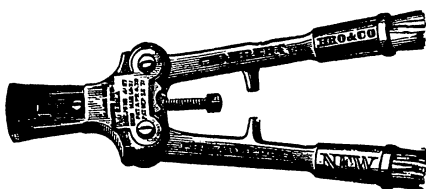
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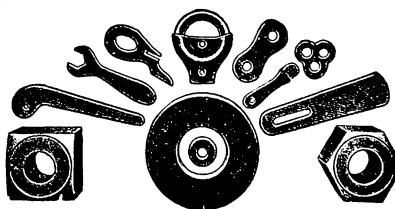
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Whitney, A. & Sons, Phila.
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Passaic Art Casting Co., Passaic, N. J.
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Graham Twist Drill & Chuck Co., Detroit, Mich.
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Skinner Chuck Co., New Britain, Conn.
Union Mfg. Co., 103 Chambers, N. Y.
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McCoy, Jos. F. & Co., 25 Warren St.
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Link Belt Engineering Co., Phila., Pa.
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Noyes, H. B. & Co., Greenfield, Mass.
Spring Curry Comb Co., So. Bend, Ind.
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Chapman Mfg. Co., Meriden, Conn.
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Utility Door Check Co., Chicago, Ill.
- Door Knobs.**
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- Dynamos.**
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North Bros. Mfg. Co., Philadelphia.
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Wollensak, J. F., Chicago, Ill.
- Electric Welding.**
Thomson Electric Welding Co., Boston, Mass.
- Electro-Platers.**
Boardman, L. & Son, East Haddam, Ct.

See Alphabetical Index, Page 116.

- Elevators, Makers of.**
Link-Belt Engineering Co., Phila., Pa.
Moline Elevator Co., Moline, Ill.
Morris, Williams & Co., Phila., Pa.
Salem Fdry & Mch. Co., Salem, Mass.
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Otto Gas Engine Works, Phila., Pa.
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Norwalk Iron Works Co., So. Norwalk, Conn.
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Wetherill, Robt. & Co., Chester, Pa.
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Sweester, W. A., Brockton, Mass.
- Expansion Bolts.**
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- Faucets, Wooden, Makers of.**
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Webster, Warren & Co., Phila., Pa.
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Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
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Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foos & Co., Springfield, O.
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Reliance Wire Works Co., Milwaukee, Wis.
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Butcher, W. & S., 135 Duane St., N. Y.
McCauley File Co., Philadelphia.
Nicholson File Co., Providence, R. I.
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Garner, J. & Co., Cumberland, Md.
Kreischer B & Sons, foot E. Houston St., Maurer, H. & Son, 420 E. 23d, N. Y.
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Presbury Stove Lining Co., Taunton, Mass.
Vaentine, M. L. & Bro., Woodbridge, N. Y.
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- Fishing Tackle.**
Dane, Stoddard & Kendall, Boston, Mass.
Enterprise Mfg. Co., Akron, O.
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Fodder Cutters.**
Silver Mfg. Co., Salem, O.
- Forges, Portable, &c.**
Bradley & Co., Syracuse, N. Y.
Bullock Hollow Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Scranton Forging Co., Scranton, Pa.
- Foundry Facings.**
Chicago Fdy. Supply Co., Chicago, Ill.
MacKellar Foundry Facing & Supply Co., Quincy, Ill.
Paxson, J. W. & Co., Phila.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.
Whitehead Bros. Co., 517 W. 15th St.,
- Foundry Riddles.**
Estey, W. S., 65 Fulton, N. Y.
- Foundry Supplies.**
Chicago Fdy. Supply Co., Chicago, Ill.
Colligan, Victor, Detroit, Mich.
MacKellar Fdy. Facing & Supply Co., Quincy, Ill.
S. Obermayer Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia.
Smith, J. D. Fdy. Supply Co., Cinn., O.
Whitehead Bros. Co., 517 W. 15th St.,
- Friction Clutches.**
Moore & White Co., Philadelphia, Pa.
- Fruit Presses.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Fuel Burners.**
Collins, W. S., 45 Drexel Bldg., N. Y.
- Garden Tools.**
Noyes, B. B. & Co., Greenfield, Mass.
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**
Pancoast & Mauls, Phila., Pa.
- Gear Cutters.**
T. E. Whiton Mach. Co., New London, Conn.
- Gears.**
Boston Gear Works, Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
New Process Raw Hide Co., Syracuse, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Union Fdy. & Mch. Co., Pittsburgh, Pa.
- Glass Boards.**
Canton Saw Co., Canton, O.
- Glass Tubes.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
- Glass Cutters.**
Monce, S. G., Bristol, Conn.
- Glue.**
Baeder, Adamson & Co., Phila., Pa.
Leggett & Bros., 301 Pearl St., N. Y.
Lussie Cement Co., Gloucester, Mass.
- Grinding and Polishing Machinery.**
Norton Emery Wheel Co., Worcester, Mass.
Wasburn Shops, Worcester, Mass.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stone Co., Cleveland, O.
Huron Grindstone Co., Port Austin, Mich.
- Gunpowder, Makers of.**
Lafin & Rand Powder Co., N. Y.
- Hand Carts.**
Lansing Wheelbarrow Co., Lansing, Mich.
- Handles.**
New Process Raw Hide Co., Syracuse, N. Y.
New York Mallet and Handle Wks., 450 S. Houston St., N. Y.
- Hangers, Door.**
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.
- Hardware Commission Merchants.**
Doser, Martin, 88 Chambers, N. Y.
Jacobus, W. E., 90 Chambers, N. Y.
- Hardware Manufacturers.**
Bochiska, E. S., Bridgeport, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Graman, John H. & Co., 113 Chambers, McCoy, Jos. F. Co., 25 Warren St., N. Y.
S. Sweet, Lyman, 55 Barclay, N. Y.
Surplus, Dunn & Alder, 97 Chambers St., New York.
Underhill, Clinch & Co., 94 Chambers St., N. Y.
- Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Bailey, F. E. & Co., Chicago, Ill.
Beiden Machine Co., New Haven, Conn.
Cleveland Fdy. Co., Cleveland, O.
Ellis, Geo. D. & Sons Co., Philadelphia, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Hart, H. C. Mfg. Co., Detroit, Mich.
Henn, A. S. & Co., New Haven, Conn.
Horn Novelty Mfg. Co., St. Louis, Mo.
North Bros. Mfg. Co., Philadelphia, Pa.
Shepard, Sidney & Co., Buffalo, N. Y.
Welland, Chas., 143 Chambers St., N. Y.
Wire Goods Co., Worcester, Mass.
Underhill, Clinch & Co., 94 Chambers Street, N. Y.
- Hardware, Yacht and Ship.**
Ferdinand, L. W. & Co., Boston, Mass.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Cover's Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Knives.**
Hoit, Hiram, Co., E. Wilton, Me.
- Holting Machines.**
Box, Alfred & Co., 314 Green, Phila.
J. Brown Holting & Conveying Mch. Co., Cleveland, Ohio.
Copeland & Bacon, 35 Liberty St., N. Y.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 48 Liberty, N. Y.
May & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
- Hollow-Ware.**
Bronson Supply Co., Cleveland, Ohio.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speidel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.
- Hollowware, Aluminum.**
Illinois Pure Aluminum Co., Lemont, Ill.
- Horse and Barbers' Clippers.**
Hotchkiss, E. S., Bridgeport, Conn.
- Horse Nails, Makers of.**
Ausable Horse Nail Co., Warren, N. Y.
National Horse Nail Co., Vergennes, Vt.
- Horse Shoes, Makers of.**
Bryden Horse Shoe Co., Catsaqua, Pa.
Bryden Iron Co., Troy, N. Y.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Riddle Island Perkins Horse Shoe Co., Providence.
Standard Horse Shoe Co., Boston, Mass.
The Burden Iron Co., Troy, N. Y.
- Hose.**
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.
- Hose Menders.**
Hudson, C. E. & Co., Leominster, Mass.
- Hotels.**
The Audubon, Chicago, Ill.
- Hydrants, &c.**
McLean, John, 298 & 298 Monroe, N. Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.
- Ice-Cream Freezers.**
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
Shepard Horse Co., Buffalo, N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.
White Mountain Freezer Co., Nashua, N. H.
- Ice Shavers.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Injectors.**
Jenkins Bros., New York
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.
Page, Newell & Co., Boston, Mass.
- Iron Commission Brokers.**
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Bradley & Co., Philadelphia.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Mott, E. & Co., Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, L. R. & Co., Phila., Pa.
- Iron Ore.**
Naylor & Co., 45 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pulman, J. Wesley, Phila., Pa.
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**
Barnes, C. K. & Co., Philadelphia, Pa.
Borden & Loring, West, N. Y.
Bussanien & Cuniffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Bradley & Co., Philadelphia.
Hoffman, J. W. & Co., Philadelphia.
Judson, B. F., 457 Water, St., N. Y.
Leonard, J., 446 West St., N. Y.
Naylor & Co., 45 Wall St., N. Y.
Nicolis, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St., N. Y.
Page, Newell & Co., Boston, Mass.
Pickands, Brown & Co., Chicago, Ill.
Pierston & Co., 24-27 West, N. Y.
Richards, D. W. & Co., 38 Canal St., N. Y.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott, Jere & Co., N. Y. and Boston.
Judson, B. F., 457 Water St., N. Y.
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet, Manufacturers of.**
Ethna Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Wheeling Steel & Iron Co., Wheeling, W. Va.
W. Deewes Wood Co., Lim., McKeesport, Pa.
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Lindsey Saylor Wire Co., St. Louis, Mo.
Mast, Foos & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladders.**
Davies, Chas. & Co., Williamsport, Pa.
- Ladies.**
Detroit Fdy. Equipment Co., Detroit, Mich.
- Lamp Stoves.**
Cleveland Foundry Co., Cleveland, O.
- Lanterns.**
Dietz, R. E. & Co., 60 Lighthouse, N. Y.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lathes.**
Millers Falls Co., 98 Reade, N. Y.
Sebastian Lathe Co., Cincinnati, O.
Sebastian, May & Co., Sidney, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mattedocks.**
Railway Speed Recorder Co., Kent, O.
- Lawn Mowers.**
Binham, W. Co., Cleveland, O.
Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
- Oldwell Lawn Mower Co., Newburg, N. Y.**
F. & N. Mfg. Co., Richmond, Ind.
Fenley, H. C., Richmond, Ind.
Lape, W. E., Syracuse, N. Y.
Mast, Foos & Co., Springfield, O.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplies Hdw. Co., Phila., Pa.
Surplus, Dunn & Alder, 97 Chambers St., N. Y.
Wils in Whiteley & Co., Springfield, O.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, O.
Graham, John H. & Co., 111 Chambers St., New York.
Schaeffer & Co., Dayton, Ohio.
- Lawn Sprinklers.**
Blair Mfg. Co., Springfield, Mass.
Bonnette Arc Lawn Sprinkler Co., Bay City, Mich.
Ette & Henger Mfg. Co., St. Louis, Mo.
- Lawn Sweepers.**
Lape, W. E., Syracuse, N. Y.
- Lawn Swings.**
Davies, Chas. & Co., Williamsport, Pa.
- Lemon Squeezers.**
Ripley Mfg. Co., Unionville, Conn.
- Letter Boxes.**
Merriam Mfg. Co., Durham, Conn.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Davis & Cook, Watertown, N. Y.
Richardson, C. F. & Son Athol, Mass.
- Locks & Knobs, Manufacturers of.**
Deitz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Sargent & Co., 37 Chambers St., N. Y.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Warner Lock Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Conn.
- Machinery.**
Am. Tool Works, Cleveland, Ohio.
Anthracite Brass Wks., Tamaqua, Pa.
Barnes, W. F. & John, Hockfort, Ill.
Becker, Jno. Mfg. Co., Fitchburg, Mass.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Day, N. Y.
Bignall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Brown & Sharpe Mfg. Co., Providence, R. I.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 47 Cortlandt, N. Y.
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Cruikshank, D. B., Providence, R. I.
Davis, W. P., Rochester, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Light & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Harrington, E. Son & Co., Phila., Pa.
Henderson Machine Tool Co., Phila., Pa.
Henderson Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Ingersoll Milling Machine Co., Rockford, Ill.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Works, Cincinnati, O.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
McCabe, J. J. Supply Co., Rochester, N. Y.
Manville, E. J. Mch. Co., Waterbury, Conn.
Newark Mch. Tool Works, Newark, N. J.
New Haven Mfg. Co., New Haven, Conn.
New York Macdy's Depot, N. Y.
Niles Tool Wks., 138 Liberty St., N. Y.
Pedrick & Ayer, Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Conn.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons L. F., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
Woodruff Mfg. Co., Hartford, Conn.
- Machinery for Hardware Manufacture.**
Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
Loring Coes & Co., Worcester, Mass.
- Machine Tools.**
See Machinery.
- Machine Work.**
Angus, C. H., Albany, N. Y.
- Machinists' Scales.**
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
Brown & Sharpe Mfg. Co., Providence, R. I.
King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.
- Mallets.**
N. Y. Mallet & Handle Works, N. Y.
- Manufacturing Sites.**
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
Illinois Central R. R. Co., Chicago, Ill.
- Measuring Tapes.**
Lufkin Rule Co., Saginaw, Mich.
- Ment Cutters.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Metals.**
Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.
- Metal Brokers.**
American Metal Co., N. Y.
- Metalburgists.**
Britton, J. Blodgett, Phila.

- Metal Saws.**
Ehrhardt, Gustave & Sons, Pittsburg, Q & C Co., Chicago, Ill.
- Milk Cans and Trimmings.**
Shepard, Signy & Co., Buffalo, N. Y.
- Milling Machines.**
Ingersoll Milling Machine Co., Rockford, Ill.
- Mining Knives.**
Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
Darby, Edw. & Sons, Phila. Pa.
Leonard, B. E., Scranton, Pa.
Leonard, T. F., Scranton, Pa.
- Mining Machinery.**
Fraser & Chalmers, Chicago, Ill.
- Mining Screens.**
Harrington & King Perforating Co., Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y.
- Model Builder.**
Wet, C. J. & Co., 106 Liberty St. N. Y.
- Molding Sand.**
Chicago Foundry Supply Co., Chicago, Ill.
Obermayer, S. Co., Cincinnati, O.
Faxon, J. W. & Co., Phila.
Whitehead Bros. Co., 517 W. 15th St. N. Y.
- Motors, Water and Electric.**
Thomson, Houston Motor Co., Boston, Mass.
- Nail Machinery.**
Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nails (Cut) and Spikes.**
Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., 81 W. Washington, N. Y.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Works, Wheeling, W. Va.
Stebbins, C. J., 108 Reade, N. Y.
- Nickel Platers' Supplies.**
Zucker & Levent Chemical Company, 10 to 14 Grand St., N. Y.
- Norway Shapes, Bolters of.**
Rowland, William & Harvey, Framford, Philadelphia
- Nut Machines.**
Dunham Nut Mch. Co., Unionville, O.
- Nuts, Bolts, &c., Makers of.**
American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Baskell, Wm. H. Co., Pawtucket, R. I.
Port Chester Bolt and Nut Co., Port Chester, N. Y.
Russell, Burdall & Ward, Port Chester
Sternbergh, J. H. & Son, Reading, Pa.
Wilson, J. Fred, Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Stones.**
Pike Mfg. Co., Pike Station, N. H.
- Ore Sampling Machines.**
Fraser & Chalmers, Chicago, Ill.
- Ores.**
Winter, Francis, Philadelphia, Pa.
- Or Sheds.**
Scranton Lumber Co., Scranton, Pa.
Woodruff, Walter W. & Sons, Mt. Carmel, Conn.
- Packing.**
Billington, Jas. H. & Co., Phila., Pa.
Morris, Robt., St. Louis, Mo.
E. F. Belting & Packing Co. Ltd., N. Y.
- Paints.**
Detroit Granite Mfg. Co., Detroit, Mich.
Dixon, Jos. Crucible Co., Jersey City, N. J.
- Paint Burners.**
Dangler Stove & Mfg. Co., Cleveland, O.
- Patent Solicitors.**
Ashley, J. A., Washington, D. C.
Fitzgerald, F. C., Washington, D. C.
Hawson & Houson, Phila. & Washgton.
Jenner, H. W. T., Washington, D. C.
Paine & Ladd, Washington, D. C.
Rocking, E. B., Washington, D. C.
- Perforated Metal.**
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
- Phosphor Bronze.**
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia.
- Phosphor Tin.**
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Crosby Steam Gauge & Valve Co., Boston, Mass.
- Picks and Mattocks.**
Plumb, Fayette K., Philadelphia, Pa.
- Pike Iron.**
Houston, C. B. & Co., Philadelphia, Pa.
Mann, Edwin R., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 45 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.
Wheeling Steel & Iron Co., Wheeling, W. Va.
- Pike Iron Storage.**
Am. Pike Iron Storage Warehouse Co., 44 Wall, N. Y.
- Pike Drivers.**
Vulcan Iron Wks., Chicago, Ill.
- Pipe, Bent.**
National Bending Co., New Haven
- Pipe Cutting and Threading Machines.**
Bignall & Keeler Mfg. Co., St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Pancoast & Maule, Philadelphia.
Sander's Sons, D., Yorkers, N. Y.
- Pipe (Grp).**
Fremont Pipe Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas. Makers of.**
Cumberland Nail & Iron Co., Phila. Pa.
Donaldson Iron Co., Emaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
- Plane Irons, Manufacturers of.**
Buck Bros., Millbury, Mass.
- Planes, Manufacturers of.**
Stanley Rule & Level Co., N. Y.
- Plate, Iron and Steel, Mfrs of.**
Amos Iron & Steel Co., Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorhead-MoLean Co., Pittsburgh, Pa.
Mellvain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
- Singer, Nimick & Co., Pittsburgh, Pa.**
The Mahoning Valley Iron Co., Youngstown, O.
Wellman Iron & Steel Co., Thurlow, Pa.
Wood Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
Angus, C. H., Albany, N. Y.
Shepard Hdw. Co., Buffalo, N. Y.
Wilmoth & Hobbs Mfg. Co., Bridgeport, Conn.
- Plumbago.**
Chicago Fdy. Supply Co., Chicago, Ill.
- Plows.**
Ross, A. M. & Co., Illon, N. Y.
- Polishing Machine.**
Watson & Stillman, 204 E. 43d, N. Y.
- Polishing Wheel.**
La Massena, C. E. & Co., Newark, N. J.
- Post Hole Diggers.**
Gibbs Mfg. Co., Canton, Ohio.
Graham, John H. & Co., 113 Chambers St., New York.
Kohler, F. E. & Co., Canton, O.
Wister, L. & R. & Co., Philadelphia, Pa.
- Poultry Nettings.**
Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
- Powder.**
Lafin & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**
Stover Novelty Wks. Freeport, Ill.
- Power Hammer.**
Bradley & Co., Syracuse, N. Y.
Belden Mach. Co., New Haven, Conn.
Dienelt & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Hackney Hammer Co., Cleveland, O.
Jenkins & Lingie, Bellefonte, Pa.
Long & Alstatter Co., Hamilton, Ohio
- Power Punches and Shears.**
Eaton, Geo. H. & Co., Boston, Mass.
Long & Alstatter Co., Hamilton, Ohio
- Presses, Dies, &c.**
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Niagara Stamping and Tool Co., Buffalo, N. Y.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury, Conn.
- Presses, Power, Makers of.**
Bliss, E. W. Co., Brooklyn, N. Y.
Eaton, Geo. H. & Co., Boston, Mass.
Hawville, E. J. Mch. Co., Waterbury, Ct.
Merriman, A. H., Meriden, Conn.
Niagara Stamping and Tool Co., Buffalo, N. Y.
Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.
- Pulleys.**
Lake, J. H. & D. Co., Hornellsville, N. Y.
- Pulverizing Mill.**
Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Hobbs-Corliss Steam Pump Co., Chicago, Ill.
McGowan, J. H. & Co., Cincinnati, O.
Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.
Southark Fdy. & Mch. Co., Phila. Pa.
Valley Pump Wks. Co., Washington, Mass.
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Pumps, makers of.**
Bellevue Pump Co., Bellevue, Iowa.
Deming Co., Salem, U.
Douglas, W. & B., Middletown, Conn.
East, Foss & Co., Springfield, O.
Hobbs, E. & Bro., Ashland, O.
St. Joseph Pump Co., St. Joseph, Mo.
- Punches and Shears, Hand and Power.**
New Doty Mfg. Co., Janesville, Wis.
Niagara Stamping and Tool Co., Buffalo, N. Y.
Stark Mch. & Tool Co., Buffalo, N. Y.
- Punching and Shearing Presses.**
E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Crosby, G. A. & Co., Chicago, Ill.
Stiles & Parker Press Co., Brooklyn, N. Y.
- Wals & Roos, Punch & Shear Co., Cincinnati, Ohio.**
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
Hire, L. K., Chicago, Ill.
Perry, W. H. & Co., Providence, R. I.
Richards, J. H. & Co., Pittsburgh, Pa.
- Railway Supplies.**
Scully Steel & Iron Co., Chicago, Ill.
- Rat and Mouse Traps.**
Burditt & Williams, Boston, Mass.
Ester, W. S., 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.
- Razors.**
Butcher, W. & S., 135 Duane St., N. Y.
Curley, J. & Bro., 6 Warren St., N. Y.
Electric Cutlery Co., 118 Chambers, N. Y.
Schmitz, E. Lothar, 92 Reade St., N. Y.
Southington Cutlery Co., Southington, Conn.
J. B. Torrey Razor Co., Worcester, Mass.
- Refrigerators.**
Challenge Corn Planter Co., Grand Rapids, Mich.
Grand Rapids Refrigerator Co., Grand Rapids, Mich.
Kankakee Mfg. Co., Kankakee, Ill.
Refrigerator Door Fasteners.
Conroy, P. J. & Co., Philadelphia.
- Rivers.**
Blake & Johnson, Waterbury, Conn.
Burden Iron Co., Tr. N. Y.
Cobb & Drew, Plymouth, Mass.
Henderson, Jas. S., 165 Greenwich, N. Y.
Plymouth Mills, Plymouth, Mass.
- Sternbergh, J. H. & Son, Reading, Pa.**
Townsend, W. F. & Co., New Brighton Pa.
- Riveting Machines.**
Adt. Jno. & Sons, New Haven, Conn.
- Rock Drills.**
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Rand Drill Co., 28 Park Place, N. Y.
- Rolling Mill Machinery.**
Birmingham Iron Fdry, Birmingham, Conn.
Booth, The Lloyd Co., Youngstown, O.
Leachburg Foundry & Mch. Co., Pittsburgh, Pa.
Mahoning Fdry & Mch. Co., Danville, Pa.
Morgan Construction Co., Worcester, Mass.
Roblin-Rea Mfg. Co., Pittsburgh, Pa.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Roll Lathes.**
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**
Booth, The Lloyd Co., Youngstown, O.
Chicago Foundry Co., Chicago, Ill.
Garrison, F. C., Co., Pittsburgh, Pa.
Johnson Foundry Co., Johnstown, Pa.
Seaman, Sleeth & Black, Pittsburgh, Pa.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Roofing.**
Berlin Iron Bridge Co., E. Berlin, Conn.
Boston Bridge Works, Boston, Mass.
Cambridge Bridge Co., Cambridge, O.
Johns, H. W. Mfg. Co., 87 Maiden Lane
- Rope.**
Travers Bros. Co., 107 Duane St., N. Y.
- Rope and Web Goods.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.
- Rubber Goods.**
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
Larkin Rule Co., Saginaw, Mich.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, N. Y.
- Sad Iron Holders.**
Kesner, J. L. & Co., Chicago, Ill.
- Sad Irons.**
Cleveland Fdry Co., Cleveland, O.
Universal Sad Iron Co., Milwaukee, Wis.
- Sand Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
Caldwell Mfg. Co., Rochester, N. Y.
Hugunin, R. B., W. F. Mfg. Co., Hartford, Conn.
Pullman Sash Balance Co., Rochester, N. Y.
Stewart & Baker, Rochester, N. Y.
- Sash Centres.**
Howarth Reversible Sash & Sash Centre Co., Detroit, Mich.
- Sash Cords and Chains.**
Morton, Thos., 65 Elizabeth, N. Y.
Ossawun Mills Co., Norwich, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Eggs, Mfg. Co., Bridgeport.
- Sash Holders.**
Motley, Peter, Philadelphia, Pa.
- Sash Locks.**
Invention Safety Lock Co., Cleveland, Ohio.
Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**
Empire Portable Forge Co., Lansingburgh, N. Y.
Farnes, Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
Brown, E. & Co., Philadelphia, Pa.
Atkins, E. C. & Co., Indianapolis, Ind.
Disston, Henry & Sons, Phila., Pa.
Jennings, C. E. & Co., 37 Chambers, N. Y.
Kirk, J. S. & Co., 98 Reade St., N. Y.
Richardson Bros., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**
Kohler, F. E. & Co., Canton, Ohio.
Taintor Mfg. Co., 84-86 Chambers, N. Y.
Lloyd, W. J. Mfg. Co., Phila., Pa.
- Scales, Makers of.**
Burton, Scale Co., Buffalo, N. Y.
Chattillon, John & Sons, 85-89 Cliff, N. Y.
Osgood & Co., Binghamton, N. Y.
- Scrapers, Road.**
Sidney Steel Scraper Co., Sidney, O.
- Screens, Door and Window.**
Queen Anne Screens, Burlington, Vt.
- Screw Cutting Machinery.**
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
Alford & Berkele Co., 75 Chambers St.
- Brown, R. H. & Co., New Haven, Conn.**
Capitol Mfg. Co., Chicago, Ill.
Chantrell Tool Co., Reading, Pa.
Mayhew, H. H. Co., Sheburne Falls, Mass.
- Screw Plate and Pipe Cutter.**
Jasecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket.
Miles, F. S., 205 Quarry, Philadelphia.
National Screw & Tack Co., Cleveland, Ohio.
Reynolds & Co., New Haven, Conn.
Worcester Machine Screw Co., Worcester, Mass.
- Seroll Saws.**
Barnes, W. F. & John, Rockford, Ill.
Beneca Falls Mfg. Co., Beneca Falls, N. Y.
Bryce, Stone and White, Watertown.
- Seroll Mfg. Co., Pike Station, N. H.**
Cleveland Stone Co., Cleveland, O.
Huron Grindstone Co., Port Austin, Mich.
- Shafting, Makers of.**
Cresson, Geo. V., Co., Philadelphia, Pa.
Fairmount Mch. & Tool Co., Bridgeport, O.
Fitzsimons & Co., Cleveland, Ohio.
Sellers, Wm. & Co., Inc. Phila. Pa.
Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manufacturers of.**
Etna Iron & Steel Co., Bridgeport, O.
Allentown Rolling Mill, Phila.
Illbruck Steel Co., Chicago, Ill.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
- Passaic Rolling Mill Co., Paterson, N. J.**
Pottsville Iron & Steel Co., Pottsville, Pa.
- Roberts, A. & P. Co., Phila., Pa.**
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Etna Iron and Steel Co., Bridgeport, Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburgh, Pa.
Moorehead-McCleane Co., Pittsburgh, Pa.
Pierston & Co., 24-29 West St., N. Y.
Reilly, John W., Fort Hunter P. O., Pa.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, Pa.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**
Mathlessen & Hegeler Zinc Co., La. Salle, Ill.
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Chrome Steel Works, Brooklyn, N. Y.
- Shovels, Spades and Scoops.**
Ross, A. M. & Co., Illon, N. Y.
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Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
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Henley, H. J., Richmond, Ind.
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- Smelting Works.**
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- Speaking Tubes.**
Ostrander, W. R. & Co., N. Y.
Wollensak, J. F., Chicago, Ill.
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- Speed Indicators.**
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- Spelter.**
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 Jones, B. M. & Co., Boston, Mass.
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 La Belle Steel Co., Pittsburgh, Pa.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Moorhead-McCleane Co., Pittsburgh, Pa.
 Moss, F. W., 83 John, N. Y.
 Naylor & Co., 45 Wall, N. Y.
 Pennsylvania Steel Co., Steelton, Pa.
 Pearson & Co., 24-27 West, N. Y.
 Pottsville Iron and Steel Co., Pottsville, Pa.
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 Steel & Iron Improvement Co., Pittsburgh, Pa.
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 Wordlaw, S. C., Sheffield, Eng.
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 Montour Iron & Steel Co., Davitt, Pa.
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 A. Field & Sons, Taunton, Mass.

Cobb & Drew, Plymouth, Mass.
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 Nat. Screw & Tack Co., Cleveland, O.
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 Manning, Maxwell & Moore, 111 Liberty, N. Y.
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 Wiley & Russell Mfg. Co., Greenfield, Mass.
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Testing Machines.
 Riehle Bros. Testing Mch. Co., Phila.
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 Frost Spring Co., Boston, Mass.
 Sabin Machine Co., Montpelier, Vt.
Time Record.
 Scattergood, H. W., Phila., Pa.
Tinners' Hardware.
 Berger Bros., Philadelphia, Pa.
Tinning Process.
 Sands, Thomas, Nashua, N. H.
Tin Plate Machinery.
 Lloyd Booth Co., Youngtown, Ohio.
Tinware.
 Am. Stamping Co., 104 & 106 John St., Machat, Ingram & Co., Baltimore, Md.
Toe Calks, Steel.
 Burke, P. F., Boston, Mass.
Tool Chests.
 Am. Tool Co., 200 W. Houston St., N. Y.
 Jennings C. E. & Co., 97 Chambers St. N. Y.
Tools.
 Atkins, E. C. & Co., Indianapolis, Ind.
 Britton, Horace E., Stoughton, Mass.
 Brown, R. H. & Co., New Haven, Conn.
 Chantrell Tool Co., Reading, Pa.
 Jennings, C. E. & Co., 97 Chambers, N. Y.
 Kneuter & Co., Newark, N. J.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
 Millers Falls Co., 93 Reade St., N. Y.
 Richardson, C. F. & Son, Athol, Mass.
 Standard Tool Co., A. Hol, Mass.
 Stanley Rule & Level Co., 28 Chambers, Starrett, L. S., Athol, Mass.
Tools, Blacksmith and Wheelwrights.
 Buffalo Forge Co., Buffalo, N. Y.
 Champion Blower & Forge Co., Lancaster, Pa.
 Illinois Iron & Bolt Co., Carpenterville, Ill.
 Plumb, Fayette R., Philadelphia, Pa.
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Tools, Steam and Gas Fitters'.
 Saunders Sons, D., Yonkers, N. Y.
Tools, Oil and Gas.
 Dandier Stone & Mfg. Co., Cleveland, O.
 Schneider & Trenkaap Co., Cleveland, Ohio.
Transom Lifters.
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 Covert's Saddlery Works, Farmer, N. Y.
Washers.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Leman, E. B., Columbus, Ohio.
 Milson Mfg. Co., Milton, Pa.
 Sternbergh, J. H. & Son, Reading, Pa.
Water Meters.
 Worthington, Henry R., 85 & 88 Liberty St., N. Y.
Water Wheels.
 P. Cole, Robt. & Son Co., Baltimore, Md.
Weed Destroyer.
 Shaw & Clancy, Racine, Wis.
Well Boring Machines.
 Oil Well Supply Co., Pittsburgh, Pa.
Well Machinery.
 Amer. Well Works, Aurora, Ill.
Wheelbarrows.
 Akron Tool Co., Akron, O.
 Cockburn Barrow & Mch. Co., Jersey City, N. J.
 Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
 Lansing Wheelbarrow Co., Lansing.
 Sweeney Steel Scaper Co., Sidney, O.
 Sweat Mfg. Co., Minneapolis, Minn.
Whips.
 American Whip Co., Westfield, Mass.
Window Cord, Makers of.
 Samson Cordage Works, Boston, Mass.
Wire, Manufacturers of.
 Amer. Spiral Spring Co., Pittsburgh, Pa.
 Amer. Wire Nail Co., Anderson, Ind.
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 Eastwood Wire Mfg. Co., Belleville, N. J.
 Gaudier Steel Department of Camucia Iron Co., Johnstown, Pa.
 Haley Mfg. Co., Concord, N. H.
 Miller & Van Winkle, Brooklyn, N. Y.
 New Castle Wire Nail Co., New Castle, Pa.
 New Haven Wire Mfg. Co., New Haven, Conn.
 Prentiss, Geo. W. & Co., Holyoke, Mass.
 Salem Wire Nail Co., Salem, O.
 Trenton Iron Co., Trenton, N. J.
 Washburn & Moen Mfg. Co., Worcester, Wetherell Bros., 98 Liberty St., F. Y.
 Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
Wire Cloth.
 Barnum, E. T., Detroit, Mich.
 Clinton Wire Cloth Co., Clinton, Mass.
 Darby, Edward & Sons, Philadelphia, Pa.
 Eastwood Wire Mfg. Co., Belleville, N. J.
 Estey, W. S., 65 Fulton, N. Y.
 Gilbert & Bennett Mfg. Co., 42 Cliff.
 Howard & Morse, 45 Fulton, N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 Reelance Wire Wks. Co., Milwaukee, Wis.
 Scheeler & Sons, Buffalo, N. Y.
 Wickwire Bros., Cortland, N. Y.
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 King, J. M. & Co., Watertown, N. Y.

Wire Dies.
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Wire Door Mass.
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 Scheeler & Sons, Buffalo, N. Y.
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 Consolidated Steel & Wire Co., St. Louis, Mo.
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 Kilmer Mfg. Co., Newburg, N. Y.
 New Castle Wire Nail Co., New Castle, Pa.
 Phillips, E. & Sons, South Hanover, Mass.
 Phillips, Townsend & Co., Phila., Pa.
 Plymouth Mills, Plymouth, Mass.
 Salem Wire Nail Co., Salem, Mass.
 Taunton Wire Nail Co., Taunton, Mass.
 Whitney, A. K. & Co., New York City.
Wire Ropes, Steel.
 Amer. Wire Nail Co., Anderson, Ind.
 Consolidated Steel & Wire Co., St. Louis, Mo.
 Illinois Steel Co., Chicago, Ill.
 New Castle Wire Nail Co., New Castle, Pa.
 Washburn & Moen Mfg. Co., Worcester, Mass.
 Whitney, A. R. & Co., 17 B'way, N. Y.
 Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
Wire Ropes, Iron and Steel.
 Broderick & Bascom Rope Co., St. Louis, Mo.
 California Wire Works, San Francisco.
 Hazard Mfg. Co., Wilkesbarre, Pa.
 A. Leschen & Sons Rope Co., St. Louis.
 Trenton Iron Co., Trenton, N. J.
 Washburn & Moen Mfg. Co., Worcester, Mass.
 Williamsport Wire Rope Co., Williamsport, Pa.
Woodenware.
 Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
Wood-Working Machinery.
 Fay, J. A., & Egan Co., Cincinnati, O.
 Sebastian Lathe Co., Cincinnati, Ohio.
 Sebastian, May & Co., Sidney, O.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Wrenches, Manufacturers of.
 American Saw Co., Trenton, N. J.
 Bemis & Call Hardware & Tool Co., Springfield, Mass.
 Billings, Spencer & Co., Hartford, Conn.
 Capitol Mfg. Co., Chicago, Ill.
 Central Iron & Steel Co., Brazil, Ind.
 Coes Wrench Co., Worcester, Mass.
 Portsmouth Wrench Co., Boston, Mass.
 Trimont Mfg. Co., Roxbury, Mass.
 Williams, J. H., Brooklyn, N. Y.
Wringers.
 Colby Winger Co., Montpelier, Vt.

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THE IRON AGE.

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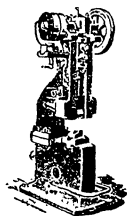
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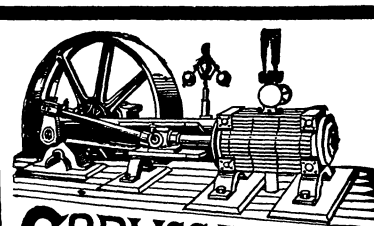
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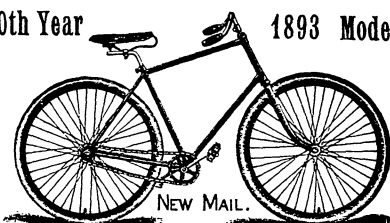
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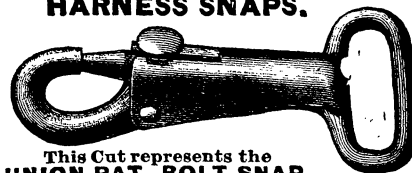
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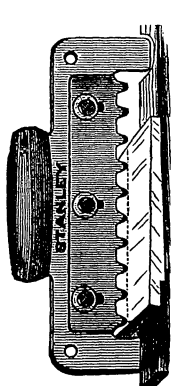
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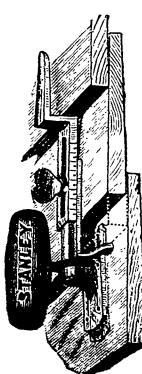


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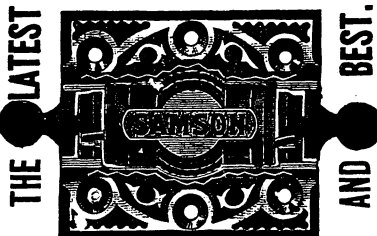
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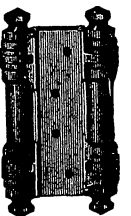
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THE IRON AGE

THURSDAY, MARCH 9, 1893.

The Bogert Turret Engine Lathe.

In the turret machine shown in the illustration, an attempt has been made to furnish machine shops with a tool that will materially reduce the time now taken in finishing work that is first chucked in one machine and then turned on an arbor in another. The headstock is shown equipped with a four-step cone for a $3\frac{1}{2}$ inch double belt, and with back gearing of a ratio of 12 to 1. It does not follow, however, that this practice is recommended in all cases. Friction back gearing is more desirable when it is necessary, for instance, to tap or counter-bore a large hole and drill a small one in the same piece. In certain varieties of work it would even be a decided gain to have double friction back gearing, making possible four changes of spindle speed without shifting the belt on the cone. The size of the

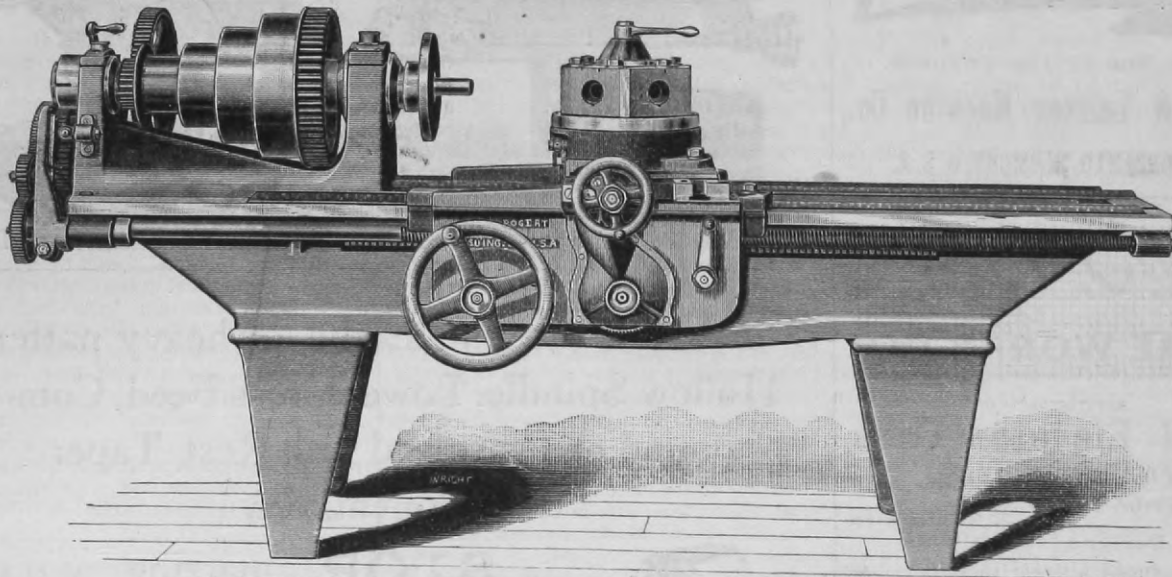
operation, with its center 6 inches out from the axis of the turret. The most vital point in any turret machine, so far as accuracy is concerned, is the indexing. Very many otherwise carefully constructed turrets, after many months, or a few years' severe service, get to have so much play in the lock bolt without any adequate provision for taking it up that no two pieces will be turned out the same size with the same tools. This defect is here guarded against. The turret may be fed out toward the front of the lathe till its axis is $10\frac{1}{2}$ inches from the line of centers; hence any surface that will swing clear of the bed may be turned with one and the same tool. The apron carries the feed gearing, which is made unusually powerful and durable, to permit the constant employment of cuts as heavy as the belt will drive. To this end the worm gears are made of phosphor-bronze, and the worms of hard

Compound Expansion Engines.—II.

(Conclusion.)

These last results are, of course, hypothetical to the extent that they are based upon the assumed condition that the steam would impart and absorb heat as rapidly as the cast iron of cylinder, due to its degree of conductivity, the object being to ascertain the maximum possibilities of effect, in quantity and degree of heat, with reference to the cylinder only.

This correction, however, will have no effect on the application of the results, as we shall see that the actual interchange of heat must be very far below the ascertained capacity of the iron cylinder; and the limit of effect, therefore, will be that due to the thermal properties of the volume of steam. We have in the 480



THE BOGERT TURRET ENGINE LATHE.

spindle is $3\frac{1}{2}$ inches, with a $1\frac{1}{8}$ -inch hole, which can be increased to 2 inches by boring. The material of which the spindle is made is very hard steel, and the boxes are lined with phosphorized babbitt metal. The lead screw, with its accompanying change gears, insures the proper starting of dies and taps, as well as the cutting or chasing of threads of any pitch or diameter with single pointed tools. The carriage is 33 inches long, and, as will be noticed, extends well forward of the turret, so that the vertical component of strains on boring tools falls always within its supporting surfaces. The construction of the cross slide, which is patented, is novel in its essential details. The cross feed screw is completely protected from chips by a telescopic slide, which moves under the turret when the latter is fed toward the front of the carriage. When boring with heavy cuts the cross slide anchor and anchor bolts eliminate vibration from the joint with the carriage. The turret is 14 inches in diameter, usually made six sided and usually bored for six $2\frac{1}{2}$ inch holes; but the size and number of holes may be varied. The lock bolt of hardened steel slides vertically between hardened steel taper wedges and its conical end is firmly seated in a hardened steel bushing directly under the tool in

steel. The engagement of the feeds is frictional, and therefore rapid. The half nuts open and close upon the lead screw with but a third of a revolution of the handle seen in a vertical position on the apron. The stop screws which control the movement of the cross-slide, as well as those governing the carriage feed, though not shown, are most important, as without adjustable stops the full measure of economy could not be obtained. In duplicate work stops take the places of scales and calipers. The bed has tapered ends, is deeper in the middle than over the legs, which latter stand $22\frac{1}{2}$ inches in from each end. This detail of design was originated by Mr. Bogert in 1882, and developed in 1885 to substantially its present form. The cross braces between the shears of the bed are arranged on the well-known system of bridge braces, each brace making an angle with the shears of about 45 degrees. Instead of the plan view being a series of rectangles, it is composed of isosceles triangles. By making the body of the bed consist of a number of vertical triangular cells any and all strains transmitted to the front shear are distributed over the braces to the back one. The lathe swings 20 inches, the bed is 8 feet 3 inches long, and the total weight 3600 pounds.

cubic inches $\frac{480}{1728} = 0.27273$ cubic foot.

The relative volume at 125 pounds is 219.6, and the weight per cubic foot 62.41 = say 0.2842 pound. Then $0.27273 \times 219.6 = 0.0775$ pound as the weight of the quantity of steam in cylinder at point of cut off. By Rankine's formula the total quantity of heat contained in 1 pound of steam at 125 pounds (calculated from results of experiments by Regnault) is found to be 1186.9, say 1187, heat units from water at 32° , as follows:

	Units.
1. Required to raise temperature of water from 32° to 344.1°	315.1
2. To overcome internal resistance to vaporization	790.2
3. To overcome external resistance to expansion.	81.6
4. Latent heat of vaporization (sum of 2 and 3)	871.8
5. Total heat of vaporization above 32° (sum of 1 and 4)	1186.9
6. Normal temperature of steam at 125 pounds (absolute pressure)	344.1°

The total heat, then, contained in the volume of steam is $1187 \times 0.0775 = 91.9925$ heat units, or but little more than twice the amount we have found the cylinder capable of absorbing for the 31.5° fall of temperature due to the final expansion. The quantity of heat actually lost by the

steam from decrease of temperature due to expansion only may be ascertained by comparing the respective amounts contained at the two temperatures. These we find to be for 262.5°, 1162 units, and for 231°, 1152 units, the difference representing 31.5° loss of temperature, being but 10 units per pound, or 10×0.0775 pound = 0.775 unit for the actual volume, or $\frac{0.775}{91.99} = 0.0084 = \frac{8.4}{1000}$ per cent. of the

whole. This, it must be remembered, refers to the difference between the average of the 25 mean temperatures and that due to the mean steam pressure for the full stroke. The extreme difference between the latter and the initial temperature of the steam, 344°, will be $1187 - 1152 = 35$ units $\times 0.0775 = 2.7125$ units. This amount may be called the normal loss, as it is a theoretically inevitable condition or effect of expansion as represented by the hypothetical adiabatic expansion curve, and to it must be added the total loss from all other sources. Considering the effect on the cylinder from the temperature due to mean variation, we have $\frac{0.775}{0.123} \div 414.25 =$

0.0152° , and from the maximum variation $\frac{2.7125}{0.123} \div 414.25 = 0.05324^\circ$, the former quantity, of course, being the effective one. Comparing this with the effect from a difference of 184.8° between the initial and terminal temperatures of the steam, as previously noted, we find the quantity of heat will be $344^\circ = 1187$ (and 5 pounds terminal pressure) = $162.4^\circ = 1131 = 56$ units difference. Then $56 \times 0.0775 = 4.34$, and $\frac{4.34}{0.133} \div 414.25 =$

0.0854° , the difference between which and the temperature due to mean variation being $0.0854^\circ - 0.0152^\circ = 0.0702^\circ$, or $\frac{0.0702}{0.0152} =$

4.67, or 467 per cent. greater than the apparently true variation. On the theory, then, that saturated steam is at the point of both condensation and evaporation, the effect of the changes of temperature must cause a proportionate amount of condensation and re-evaporation, accompanied by a resultant increase of sensible heat in the former and decrease in the latter, the effect of which will be referred to later. In the foregoing, the loss of heat by the cylinder has been considered only with relation to its effect on the volume of steam during expansion. There is, however, another important result, which is the initial condensation, or that which occurs prior to cutting off. As the hottest part of the cylinder—i. e., that included between lines 1 and 2—must at all times have a temperature considerably below that of the steam entering from the boiler, there must necessarily be a very considerable amount of condensation, which primarily decreases the volume and necessitates a further supply from the boiler to compensate for the loss; and, secondarily, causes a very rapid increase in the amount of condensation (by reason of its high specific heat), from the fact that the water is in direct contact with the entering steam. The amount of initial condensation varies very widely in different engines; but, for the purpose of comparison, we may assume a given percentage, say for the single cylinder engine, and note the effect on the actual steam consumption. For instance, it is not uncommon for this loss to amount to from 10 to 30 per cent., and if we call it 20 per cent. our volume of steam admitted up to point of cut-off becomes—not 480 cubic inches, but $480 + 20$ per cent., or 576 cubic inches. Now, as to the effect of the secondary condensation, or that occurring during expansion. Owing to the give and take transfer of heat between steam and cylinder let us say that condensation is caused

by one-half of the exposed surfaces, while the other half, at the higher temperature, is causing re-evaporization of the film of condensed steam. Then, as the piston advances, the newly uncovered portion of cylinder surface, being cooler than the steam, will condense a certain portion of the latter, the tendency being to continue the effect until the equilibrium of temperatures had been effected, or, in other words, until that of the cylinder should be increased to a point corresponding with the reduced pressure of the steam. Of course the rapid movement of the piston renders the interval of exposure too short to admit of such equilibrium being actually established, and the effect of the tendency in that direction must be proportionate to the duration of exposure. But while this condensation is going on we have the opposite effect from the previously exposed, and consequently hotter, portions of the cylinder. Here the fall of pressure will allow of the re-evaporization of the water of condensation in the effort to restore the equilibrium between temperature and pressure. This evaporation, of course, absorbs or renders latent a certain amount of sensible heat, but it does not follow that it is taken from the steam. On the contrary, owing to the high conductivity of the iron, and the actual contact between it and the water, the greater portion of heat absorbed will be from the cylinder, and therefore its effect will not be felt until the succeeding stroke. If this be a correct statement, then we should find the gain in pressure from re-evaporization to be greater than the loss by condensation—that is, with relation to the effect on mean pressure for the full stroke—for the reason that the amount of surface exposed to the higher temperature includes the areas of cylinder head and piston; while the cooler surface is only that of the internal periphery of the cylinder freshly exposed. That this is actually the fact appears to be demonstrated by the comparison of the expansion curve of the indicator card with that of the hypothetical diagram, as the former will show a pressure greater than that due to the mere effects of expansion. But while the greater mean effective pressure thus shown would apparently demonstrate a corresponding efficiency, it is not really the fact, as we must compare it, not with the indicated or nominal cut-off, but with the actual one, as represented by the additional supply of steam from the boiler necessary to make up for the heat previously abstracted from the cylinder, principally, by the re-evaporization of condensation water. Thus, if we construct a diagram upon the indicator card, in which the point of cut-off is made to represent the actual volume of steam drawn from the boiler to fill our 480 cubic inches of space, we will have (for the assumed initial condensation of 20 per cent.) 576 cubic inches, or a cut-off of 1.728 inches, instead of 1.44 inches. The theoretical curve for this cut off will be considerably higher than that shown by the indicator as representing the expansion due to the nominal cut off and steam volume; and the difference between the two should represent the loss by cylinder condensation. To make the comparison the

new expansion ratio will be $\frac{12,000}{576} = 20.83$,

the hyperbolic logarithm of which is 3.37;

then $125 \times \frac{1 + 3.37}{20.83} = 26.225$ pounds as the mean pressure, while that due to the nominal cut off is 21.095 pounds. And $26.225 - 21.095 = 5.13$ pounds, which, divided by 21.095 = 0.243, or 24.3 per cent. less mean pressure than that actually due to the amount of steam drawn from the boiler. And this loss, it should be remembered, must occur

irrespective of any external loss of heat by the cylinder, although it may be greatly increased when the latter is considerable, from want of a proper jacket or non-conducting covering. Eliminating this portion of the subject, we may make the comparison between the single and double cylinder engines entirely on the basis of cylinder condensation due to internal causes of variation in temperature. As in all calculations of this nature, the quantity of heat, or heat effect, is directly proportionate to the area and number of degrees difference in temperature, it would seem that a comparison of the products of the areas by their respective variations of temperature should give the correct relative values of the two systems. For one single cylinder, then, we have in piston and cylinder head $666\frac{2}{3}$ square inches; and in one twenty-fifth of stroke 93 square inches, making a total of 760 square inches of surface causing initial condensation. If we assume that the final re-evaporization and low terminal pressure have reduced the surface of cylinder, say to the actual terminal temperature of the steam, although it will not be accurate as representing the actual loss, it will appear correct as the basis of comparison. Then $344^\circ - 162.4^\circ = 181.6^\circ$, and $181.6^\circ \times 760$ square inches = 138,016. For the compound engine, we have in the small cylinder $100 + 100$ square inches in piston and cylinder head, and 170 square inches for one-fifth of cylinder area, making 370 square inches. The difference of temperature is $344^\circ - 240^\circ = 104^\circ$ which $\times 370 = 38,480$. In the large cylinder $500 + 500 + 379 = 1379$ square inches, which $\times (240^\circ - 162.4^\circ) = 77,60 = 107,010$. The sum of these two quantities, 38,480 + 107,010, = 145,490, appears to indicate a loss greater than that of the single cylinder, but we must take into consideration the fact that, while all of the re-evaporization in the latter, occurring after release, passes into the condenser without useful effect, that in the small cylinder, at the terminal of 25 pounds, becomes effective in the large one, and should therefore be deducted from the aggregate, making 107,010 as the loss by compound engine. The difference between this amount and the loss by single

cylinder will be $\frac{31,006}{138,016} = 0.225$, or $22\frac{1}{2}$

per cent., saving by the former in the item of cylinder condensation; i. e., if the net loss by the single cylinder be 20 per cent. of the initial volume, that by the compound engine will be but $77\frac{1}{2}$ per cent. of 20 per cent., or $15\frac{1}{2}$ per cent., net loss, as representing the initial condensation. Then, as by previous calculation of percentage of loss in mean pressure, due to the actual volume of steam drawn from

boiler, we have $\frac{100 \times 24}{480 + (480 \times 0.155)} =$

4.275 as the new expansion ratio—the hyperbolic logarithm being 1.4663. Then

$125 \times \frac{1 + 1.4663}{4.275} = 72.14$, and as we

have found in the value of C for five expansions (Part I) a mean pressure of 65.24 pounds, the difference—6.9 pounds = 0.1057, or 10.57 per cent.—represents the deficiency in mean pressure as compared with that due to the actual steam consumption. The saving, then, by compounding appears from our calculation to

be as $\frac{20 - 15\frac{1}{2}}{20} = 22\frac{1}{2}$ per cent., and en-

tirely on the basis of cylinder condensation, as assumed at 20 per cent. of the nominal volume of steam in single cylinder engine. As to the effect of external sources of heat loss, it seems hardly necessary to go into detailed calculations, as with equally efficient non-conducting coverings (which are applicable to both types of engines) the only difference in effect

will be directly proportionate to the difference of external areas. In the foregoing, of course, the object has been not to show the actual amount of saving by the compound system, but rather to point out some of the erroneous methods of calculation, and to suggest a course of investigation apparently in the right direction. From the absence of any accepted explanation of the phenomena involved in compound expansion it is reasonable to consider the question as one still to be solved, and it is hardly probable that this can be convincingly done without the most exhaustive experimental investigation on the scale of full practical operations. The expense necessarily involved in such tests places the subject beyond the reach of individual effort, which may probably account for our lack of absolute informa-

Hydraulic Power Plant of United States Coast-Defense Vessel "Monterey."

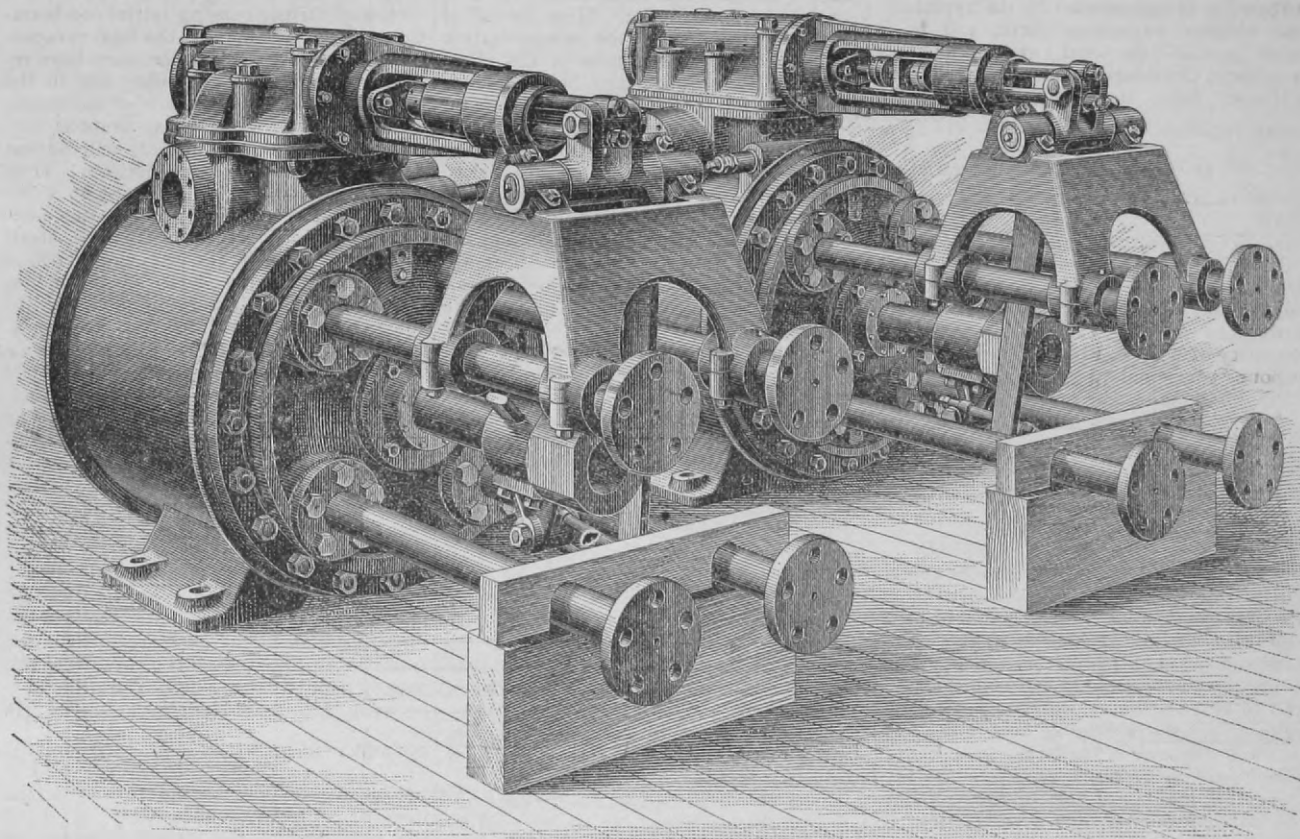
The machinery and appliances on this vessel that are worked by hydraulic power are the engines for turning the forward and the after turrets, the elevating gear of the guns contained in the turrets, the steering engines, and the opening and closing gear of the battle hatches.

The pumps for furnishing the water under pressure are two sets of horizontal pumps, one for the forward and one for the after turret, and one vertical three cylinder pump for the steering gear and battle hatches.

The plant for the forward turret, which contains two 12-inch breech-loading rifled

In order to preserve a constant water pressure in the system the following device is used, Fig. 5: A chamber of cast iron placed between the pumps is fitted with an internal cylinder in which a piston works. This piston is connected by means of its rod and levers with a throttle valve common to the two pumps.

The space in the cylinder above the piston is connected by means of a pipe with the discharge pipe of the pumps; the space below the piston is in communication with a charging machine or air compressor situated in the starboard engine room. Variations in pressure between that given by the charging machine and that produced by the pumps cause movements of the piston and adjustments of the throttle and speed of pumps until like pressures are produced.



HYDRAULIC POWER PLANT FOR U. S. COAST-DEFENSE VESSEL "MONTEREY."

tion, beyond the mere comparison of fuel consumption, as shown by the indicated power of engines of the two types.

The New York Supreme Court has recently, following precedent, decided that commercial travelers' trunks, when containing samples, are not baggage for which the railway company is liable. The principle is that the railway agrees only to carry the traveler and his clothing. It is argued that if any other rule were adopted it would be possible for a passenger to insist upon the company taking his whole furniture or half his stock of merchandise in the baggage car, in order that the merchandise might obtain as quick transport as he himself expects. At the same time, every facility not inconsistent with their duty ought to be granted by the railways to such regular patrons as the salesmen have proved themselves to be.

A regular line of steamers from New York to the river Plate will make departures on the 25th of each month for Montevideo, Buenos Ayres and Rosario, so that merchants can depend on having their goods forwarded.

guns, consists of two independent pumps discharging into the same air chamber and having steam cylinders 26 inches diameter and 27 inches stroke. The diameter of the water piston is 10 inches and its stroke is the same as that of the steam piston. The steam cylinders, which are fitted with an easily removed liner, are made of cast iron and are provided with the Dow valve gear. The water ends of the pumps are made of phosphor bronze, the water cylinders being without a working liner. The suction and delivery valves, which are arranged in four pots, consist of four groups of four valves each. The valve bodies, which are of phosphor bronze, are recessed for hard rubber faces. They are guided by a spindle on their backs and are seated by springs aided by hydraulic pressure. The steam and water ends of the pumps are bound together by four steel rods flanged at each end, the flanges being bolted to faces on the castings. The water piston is packed with square flax packing.

All water valves in connection with the pumps are straightway.

The conditions attending the use of hydraulic power on board ship do not permit the use of a weighted accumulator.

When once the air pressure in the air accumulator, as it may be called, has been raised by the charging machine to the required point, the loss of pressure from leakage is very little, as the arrangement becomes practically automatic.

The accompanying perspective view and drawings show the pumps for the after turrets, which contains two 10-inch breech-loading rifles. They are similar to those described for the forward turret, but are smaller in size.

The steam ends of these pumps were built by the Dow Company of San Francisco, and the water ends by the Union Iron Works of the same place. The pumping engine for furnishing water to the steering engines and for operating the gear for the battle hatches consists of three vertical direct-acting plunger pumps, each operated by an 8 x 8 steam cylinder. The pump plungers are continuations of the steam piston rods. The pumps are connected through cross heads and connecting rods with a crank shaft, the cranks being 120° apart. The valve, a common D slide, is worked from this shaft by the usual eccentrics and rods. A governor similar in principle to that already described for the turret pumps operates a

throttle common to all three steam cylinders.

The three systems are cross connected, so that when needed any pumps can be put on any of the work.

Tanks are fitted for holding the supply of fresh water used in the systems, the exhaust from the different hydraulic machines leading back to these tanks.

The Central Universal Mill.

During a recent visit to Harrisburg an opportunity was afforded to inspect one of the latest additions to plant in Central Pennsylvania, the large new universal plate mill of that old established concern, the Central Iron Works. A thoroughly modern plant, the mill may be regarded as

tional weight. The screws of the horizontal rolls are operated by rack and pinion through hydraulic cylinders, while the vertical rolls are operated by hand, the gearing on both sides being coupled. The maximum width which the train is capable of rolling is 42 inches. The roll tables, front and back, are 50 feet long, while the cooling table has a total length

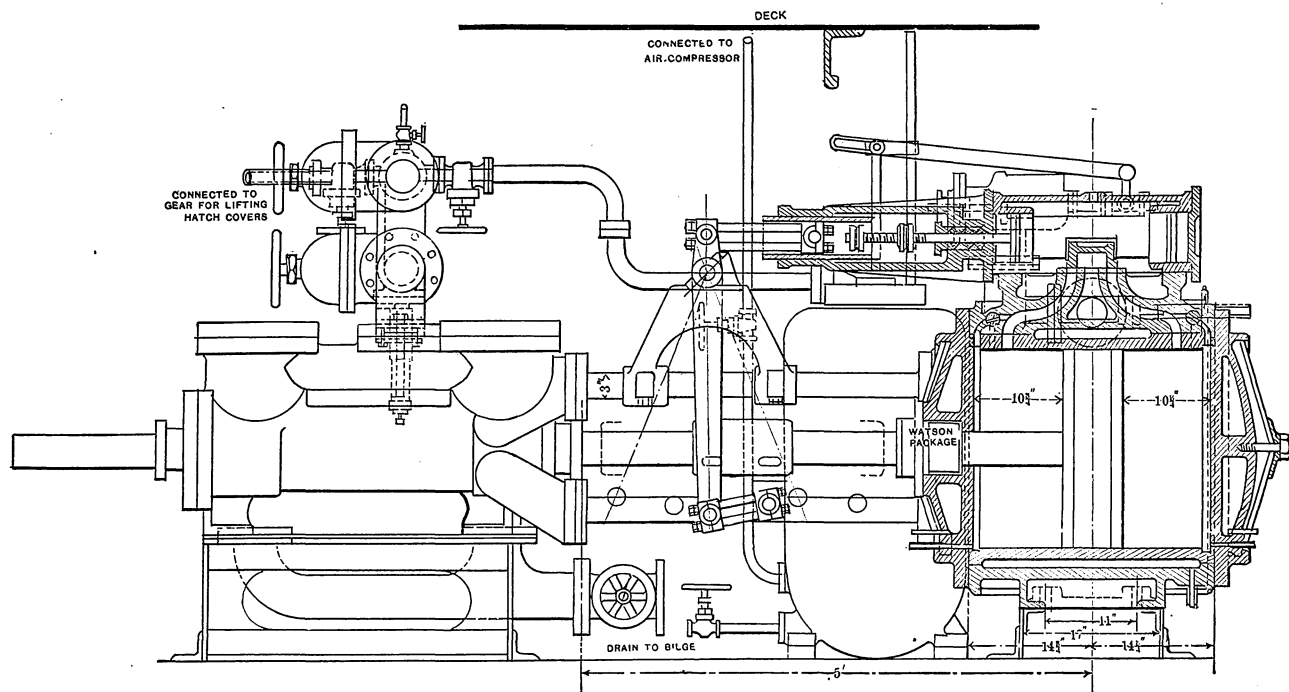


Fig. 2.—Sectional Side Elevation.

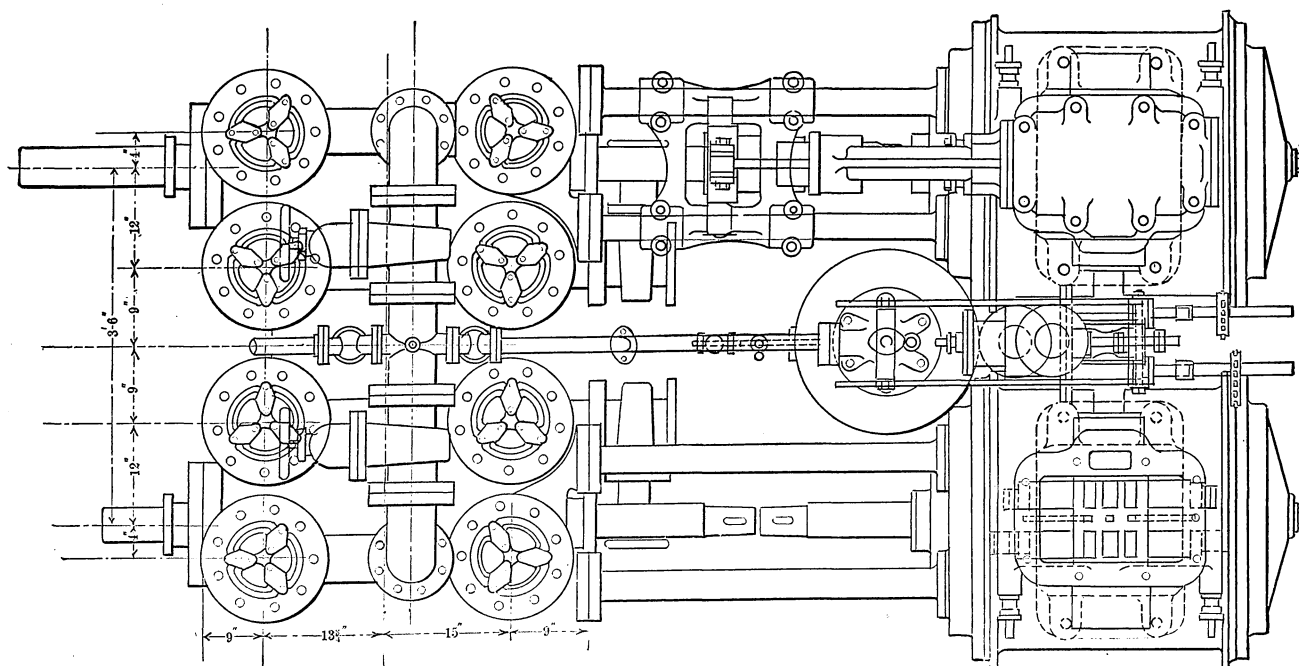


Fig. 3.—Plan.

HYDRAULIC POWER PLANT FOR U. S. COAST-DEFENSE VESSEL "MONTEREY."

The pressures used in operating the machinery are from 400 to 700 pounds per square inch.

The plan works well in actual use, the regulation being close and efficient and to all purposes automatic.

Forty men from Pittsburgh and vicinity are about to form a co-operative community at a well-known resort in the mountains of Colorado. Manufacturers are to be erected by some, while others engage in farming and mercantile business.

being in many respects a model. It is housed in a fine new iron building, 394 feet by 90 feet, the iron work of which was built by the Pennsylvania Steel Company. The train, which was built after the designs of Henry Aiken of Pittsburgh by the A. Garrison Foundry Company of Pittsburgh, has 25-inch horizontal rolls and 16-inch vertical rolls, driven by a pair of fine 30 x 60 inch engines, built by Tod & Co. of Youngstown, Ohio. The spur gearing driving the vertical rolls is placed within the housings, which are of excep-

of 80 feet. The plate is moved sideways from the cooling table by a chain rig, and a turning gear is interposed between it and the shearing table, so that both sides of the plate can be inspected. The shearing is done by a hydraulic shear, which was built by the Hydraulic Machine Company of Pittsburgh, who also built the tables, while the hydraulic pump was supplied by Wilson & Snyder of Pittsburgh.

The whole of the train, engines, tables and shipping department, with its depressed track, are controlled by a 20-ton

Morgan electric traveling crane with 65-foot span.

The iron or steel slabs are picked up by a smaller electric crane traversing the lower end of the building. Near it stand two groups of two Siemens regenerative heating furnaces, with three working doors, handled very neatly from one point by a hydraulic gear. The slabs are at present handled by a five-motor electric overhead traveling charging machine. Gas is furnished to the heating furnaces in this mill, and to one new furnace in the old plate mill, by a battery of ten Wellman gas producers, two being in reserve. The boiler plant consists of three fine batteries of boilers, two of three and one of four, erected by the Harrisburg Foundry & Machine Company. It is equipped with a Locke regulator.

The auxiliary plant embraces a tandem compound engine built by the Harrisburg Foundry & Machine Company, driving a Thomson-Houston 50-horse generator for the electric motor plant and two 50-light dynamos.

Columbia on the one hand and Eastern Australia and New Zealand on the other, but the claim of the United States to them, both commercially and geographically, is much stronger than that of Great Britain."

The New Shipping Bounty Law of France.

An article which appeared in *The Iron Age* of October 13, 1892, dealt at some length with the French shipping bounty system adopted in 1881. A summary of the provisions of the law authorizing the payment of bounties was given, the results of the practical operation of the system as illustrated by statistics were considered, and the chief features of plans proposed for adoption in a new law were noted.

It may be recalled that the law of 1881 provided for the payment of bounties both for ship construction and for over-sea or long-distance navigation, that the construction bounties were authorized without any limitation as to the length of

made by the Chamber of Deputies in the measure as submitted to it. The most important modification was the striking out of all provisions for the payment of any bounties for voyages made by merchant vessels procured abroad hereafter for employment under the French flag. The committee had reported provisions covering the payment of navigation bounties to such vessels at one-half the rates payable to French-built vessels. Another noteworthy change was the reduction of the construction bounty for iron or steel vessels to a figure far below that recommended by the committee and but slightly in excess of the rate heretofore paid under the old law.

The new law is to remain in force for ten years. Like the old one it provides for the payment of construction bounties and navigation bounties. New features are introduced, following the suggestions of the committee, in extending a navigation bounty to vessels engaged in European commerce other than local French traffic, and in providing that vessels built in

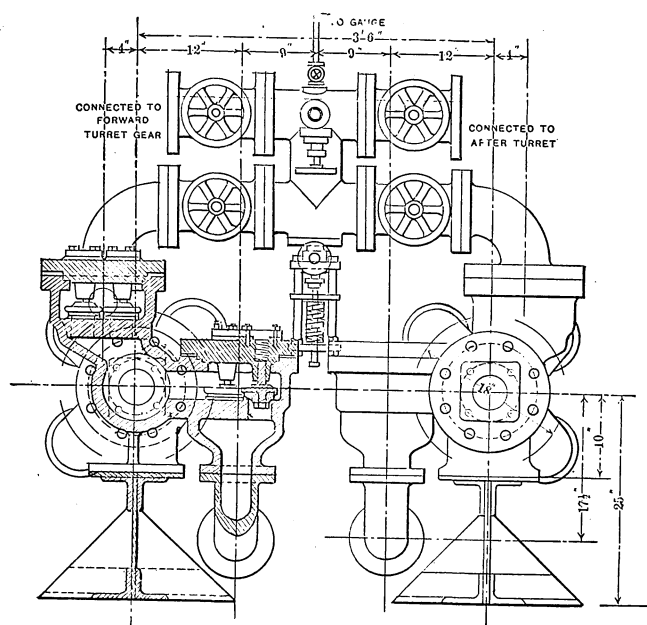


Fig. 4.—Sectional End Elevation.

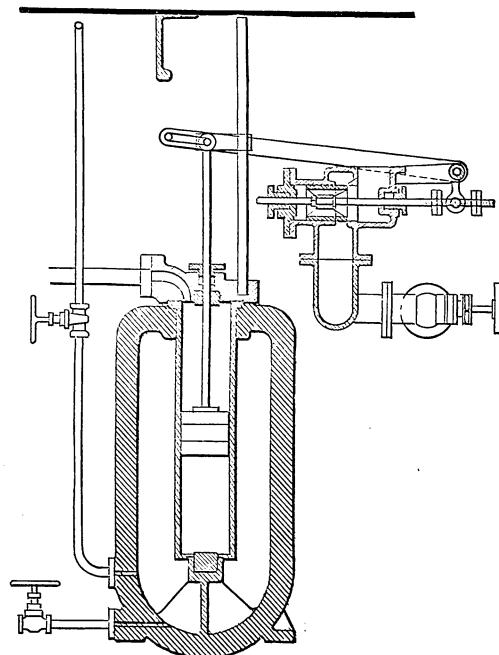


Fig. 5.—Section through Air Cylinder and Controlling Gear.

HYDRAULIC POWER PLANT FOR U. S. COAST-DEFENSE VESSEL "MONTEREY."

An exceptionally well lighted testing room contains an Olsen machine, driven by motor, and will soon be equipped with lathes, &c.

The plant, which was started in April last, has now been running for some months, its capacity being 100 tons per day.

The officers of the Central Iron Works are Charles L. Bailey, president; Edward Bailey, vice-president; G. M. McCauley, secretary and treasurer, and J. N. Binnix, superintendent.

The commercial value as well as the strategic importance of the Hawaiian Islands is the subject of discourse by Captain Mahan, U. S. N., who speaks of their commanding position with reference to the future outlet of the Nicaragua Canal on the Pacific, and says: "The islands form the center of a circle, of which the radius extends from Honolulu to San Francisco, and upon the periphery of which are found the other chief archipelagoes of the Pacific, the Gilbert, Marshall, Samoan, Society and Marquesas groups. They would form a most valuable link in the chain of naval stations between British

time the provision establishing them should continue in force, and that the navigation bounties were to be paid for a period of ten years only.

So far as they applied to French-built vessels the navigation bounties have been continued in operation since 1891 by special enactment from time to time, owing to delay in arriving at a final decision as to the details of a new and comprehensive scheme having in view the formulation of a definite policy to be operative for a further term of years.

The exhaustive inquiries and painstaking labors of a committee specially charged with the consideration of the matter resulted in the preparation of an elaborate project, which in its original form met with considerable opposition, and a compromise measure was finally submitted to the Chamber of Deputies last summer. The article to which reference has been made as having appeared in *The Iron Age* noted the salient features of this measure, which forms the basis of a new law recently adopted by large majorities in both the Chamber and the Senate.

This decisive action was not taken, however, until material changes had been

France at any time during the next ten years may continue to earn navigation bounties for ten years from date of registry. Thus there may be cases in which this feature of the law will not cease to be operative until 20 years from the present time.

The construction bounties authorized by the new law for vessels built in France during the next ten years are as follows:

	Per ton-Gross measurement.
For iron or steel vessels, steam or sail...	\$12.54
For wooden vessels of 150 tons and above.....	7.72
For wooden vessels of less than 150 tons.	5.79

For changes having the result of increasing the measurement of a vessel a bounty is to be paid, calculated for such increase on the same scale as the allowance for a new vessel.

For engines and boilers, including auxiliary machinery, a bounty of \$2.90 per 100 kg. (equal to \$1.31½ per 100 pounds) is provided. Replacing old boilers carries an allowance at the same rate for the weight of the new boilers, when of French make.

The navigation bounties authorized by the new law can be earned only by vessels built in France or by those of foreign origin admitted to French registry prior to January 1, 1893. They cannot be paid to vessels engaged in the fisheries nor to those employed in regular service on subsidized routes nor to pleasure craft. These bounties, fixed at different specified rates, are payable, subject to the restrictions noted, to vessels making over-sea voyages and to those engaged in European commerce other than the French domestic carrying trade. A minimum distance of 120 miles between a French and a foreign port is requisite, and a certain proportion of the cargo must be unloaded in the case of European ports. The navigation bounties are fixed at so much per ton, gross measurement, instead of net measurement as under the old law, for every 1000 miles run.

The rates per ton under the new law for each 1000 miles run, in the case of vessels making over-sea voyages, are as follows, subject to an annual decrease, reckoned from the date of building:

For steamers built in France, and for such foreign-built steamers as were admitted to French registry prior to 1881, the standard or full rate, to be diminished according to the age of the steamers, is 21.2 cents. For foreign-built steamers admitted to French registry during the operation of the old law, but prior to January 1, 1893, one-half the foregoing standard rate, but the full amount of an annual decrease is to be applied to the half rate.

For sailing vessels built in France, and for such foreign-built sailing vessels as were admitted to French registry prior to 1881, the standard or full rate, to be diminished according to the age of the vessel, is 32.8 cents. For foreign-built sailing vessels admitted to French registry during the operation of the old law, but prior to January 1, 1893, one-half the foregoing standard rate, but the full amount of an annual decrease is to be applied to the half rate.

The rates per ton under the new law for each 1000 miles run, in the case of vessels engaged in European commerce and entitled to bounty, are as follows, subject to an annual decrease, reckoned from the date of building:

For steamers built in France, and for such foreign-built steamers as were admitted to French registry prior to January 1, 1893, the standard rate, to be diminished according to the age of the steamer, is two-thirds the full rate for new French-built steamers making over-sea voyages, or 14.1 cents.

For sailing vessels built in France, and for such foreign-built sailing vessels as were admitted to French registry prior to January 1, 1893, the standard rate, to be diminished according to the age of the vessel, is two-thirds the full rate for new French-built sailing vessels making over-sea voyages, or 21.9 cents.

To obtain the rate of navigation bounty for any particular vessel there is deducted from the standard full rate or half rate applicable to such vessel a certain amount for every year that has elapsed since the vessel was built. This annual decrease is: For wooden sailing vessels, 1.54 cents; for wooden steamers, 1.16 cents; for iron or steel sailing vessels, 1.16 cents, and for iron or steel steamers 0.77 cent.

From the gross amount of every construction or navigation bounty, 4 per cent. is to be retained for the relief of shipwrecked French mariners and their families and also for the purpose of aiding in the establishment in French ports of institutions intended to conduce to the welfare of the maritime population.

Manufacturers in Maine have combined to utilize the water power of the Kennebec River by building reservoirs.

A Compound Air Compressor.

The increasing use of compressed air at high pressures renders the subject of improvements in compressors one of considerable importance. That there is room for improvement, even in the best types of this class of machinery, is shown by the comparatively large percentage of loss in converting steam power into useful effect through the medium of compressed air. The loss of efficiency must in any case be considerable, owing to the physical phenomena of compression—judging, at least, from our present knowledge of the subject—and therefore it becomes all the more important that the mechanical defects of the compressor be minimized. This fact is fully realized by the builders of high-class compression machinery; and though the subject has received the attention of the best engineering talent, the effort has been almost exclusively in connection with the ordinary moderate pressures, ranging from 50 to 100 pounds. While in the past, the use of what may be properly termed high pressures has been confined to exceptional cases and the machinery for the purpose considered as "special," the requirements of the present or near future would appear to suggest that it should be recognized as a distinct type and of sufficient importance to merit fully as much attention as that designed to produce lower pressures. Experience has long since demonstrated the impracticability of simple or direct compression to pressures much in excess of 100 pounds, that is, from the normal to ultimate pressure in a single cylinder at one operation, and, therefore, recourse was had to the use of two cylinders and compound compression. In the first cylinder the air is compressed from atmospheric to about one half of the desired ultimate pressure and discharged, either directly or through an intervening reservoir, into the second, smaller, cylinder, where the final compression is accomplished. By such arrangement pressures up to 500 or 600 pounds are easily attained, and when the requirements are greatly in excess of that limit they may be readily met by still further compounding, and using triple or quadruple compression by means of three or four cylinders. There is, however, an acknowledged objection to this arrangement in the unavoidable complication and multiplication of parts necessary to provide each cylinder with its separate valves, piston, and power and pipe connections. Not only is the cost of the machine proportionately increased, but its efficiency is necessarily diminished by reason of the increase of working friction, loss from leakage, and multiplication of piston and valve clearances. The accomplishment of this compound compression, whether double, triple or quadruple, in a single cylinder is the object for which the air compressor, herewith illustrated, was designed by B. Frank Teal, 442 South Campbell avenue, Chicago. The novel features of the device are embodied in the air cylinder exclusively (a sectional drawing of which is here presented) as the methods of applying the steam water or belt power are made conformable to the best modern practice and may be modified to any extent to suit the particular requirements of different applications.

The illustration shows a vertical section of air cylinder with its piston, valves, &c. A is the cylinder formed with double walls, and the intermediate space *r* serving as a water jacket. The water circulation is constant, entering at bottom and discharging at top through pipes not shown. A' is the lower cylinder head, in which are located the suction valves *q*, *q'*, which open inward, and are of the ordinary construction, except that the guide wings are set at an angle, instead of being parallel with axis,

as incorrectly shown—the object being to cause the valves to turn slightly for each stroke, in order that they shall seat at a new point with relation to the seat, and thereby wear uniformly. The piston is composed of the head and the large trunk B, the latter passing through the upper head A². The space C contained between the trunk and cylinder, forms an annular chamber, which communicates with the cylinder space below the piston head through ducts, *h*, chambers, *i*, and valves, *q'*. The bronze ring *n* serves as a guide bearing for the trunk to relieve wear on the stuffing box. It is made a driving fit in the cylinder, and bears closely against the internal flange. The discharge valve *m* is of peculiar construction, having at its inner end an air-tight piston, of same area as the valve proper. The spiral spring is made of only sufficient tension to keep the valve firmly to its seat. The object of this arrangement is to obviate the necessity for increasing pressure in the cylinder, to overcome that on back of valve, owing to the greater area of the upper as compared with the lower side. This feature, which at ordinary pressures may be neglected, at high pressures becomes of considerable importance, as may be seen. If the valve opening have a diameter of 3 inches and width of seat of $\frac{3}{8}$ inch, the difference between the upper and lower areas will be $11 - 7 = 4$ square inches, or about 57 per cent. At a receiver pressure of 500 pounds, the total pressure on back of valve will be 5500 pounds, and will require in the cylinder a pressure of $\frac{5500}{7} = 786$ pounds,

nearly, acting on lower side of valve to cause it to open for discharge. By means of the piston, the valve is caused to open as soon as the cylinder pressure shall have reached that of the receiver, as the resistance of the spring is inappreciable. The valve seat is removable for convenience of fitting the valve, and is held in place by the ribs projecting inward from cover. The opening to the discharge pipe, communicating with the receiver, is shown at *k*. There are two important features not shown in engraving. In the inner surface of lower cylinder head A', there is an annular channel formed in the solid metal surrounding the piston-rod stuffing box, which channel is covered by a ring of thin metal, in which are numerous fine perforations to form a sprinkling or, more correctly, a spraying plate. Also in the upper ring *n* a channel is turned in the outside periphery, near the bottom edge, and similar holes drilled through from the bottom. These channels are independently connected, by means of extra strong wrought-iron pipes, to the two small single acting force pumps attached to bed plate of the engine and deriving their motion from crank on the main shaft. At each stroke of the engine, the pump connected with the end of the air cylinder in which compression is taking place, is forcing cold water into the cylinder, against the increasing air pressure, while the other pump is working on the suction stroke. The piston and trunk packing is of the ordinary form of leather cups—that of the piston being double and separated by a thin metal ring, which is turned at its outer periphery to fit the rounded corner of the cups and thereby prevents their being forced out of shape by the heavy pressure. When the desired pressure is so great as to require triple compression, the trunk B is provided with a head at the top, and forms a reservoir into which the discharge from the second compression is forced. The valve *m* is omitted entirely, and is substituted by two or more smaller valves, similar to those shown at *q'*, *q'*, and located near the latter, in the piston head. The communication between the annular cylinder space C and the interior

of the trunk B^2 is by means of small ducts, like n , through the valves described. Attached to the upper head of the trunk, and projecting inwardly into the space B^2 , is a cylinder of small diameter, having at its lower end a single inlet valve. In this cylinder is a hollow plunger or trunk piston, similar to that in the large cylinder, and of like proportion of areas. At also is provided at its lower end with

the valves $q q$ close, and the contained air is compressed until the pressure is sufficient to raise the piston-head valves $q' q'$, when it is discharged into the annular space C . At the next upward stroke, while the cylinder is again filling with free air, the partially compressed volume in C receives its final compression, and is discharged through the valve m . As before stated, the water from the small force

complete displacement of the air at each stroke, as, no matter to how small a percentage the clearances of valves and piston may be reduced, the effect, under high pressures, must involve a very considerable loss unless some means of prevention be used. The surplus of water is discharged with the air at each stroke, and seals the valves against air leakage back to the cylinder.

In a horizontal compressor the piston rod is dispensed with, and the trunk, being reversed, is used to compensate for the vibration of the connecting rod, which connects directly with the wrist pin carried by jaws bolted to the piston head. This may also be done in the vertical machine, though there are serious objections to the plan, and the disadvantages would more than counterbalance the gain from its use.

(To be continued.)

A New Mitrailleuse for Cavalry.

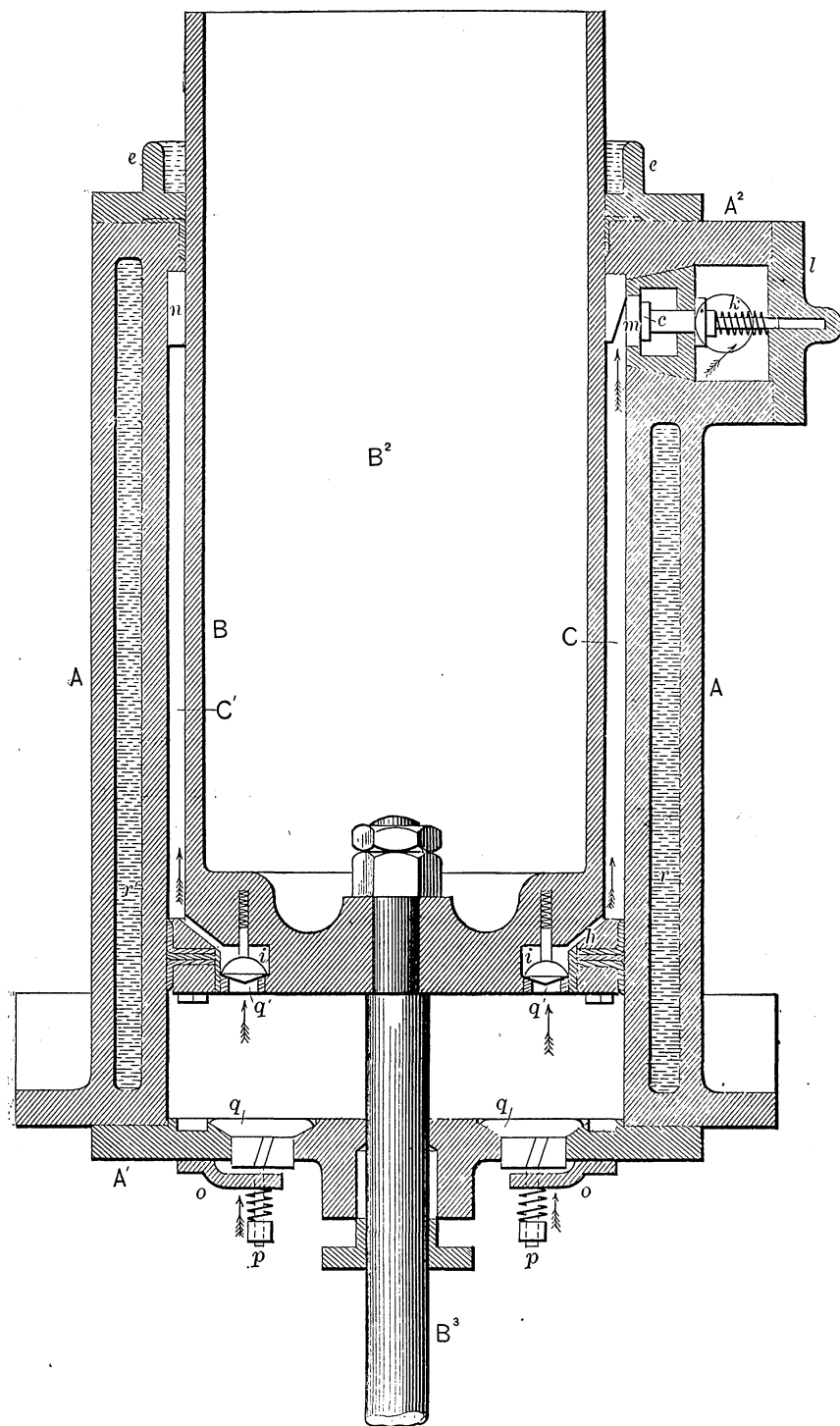
A form of mitrailleuse which, owing to its lightness, is said to be peculiarly well adapted for service involving rapid movement has been devised recently by a French artillery officer, and having been submitted to the Minister of War, is now being subjected to experimental tests. This arm is intended primarily for the use of cavalry or for employment in mountainous districts where the transportation of heavier pieces of artillery might be difficult. The inventor claims that his weapon will not impede the movements of cavalry, as each mitrailleuse complete with 2000 rounds of ammunition can be easily carried by one horse.

As a mountain gun the piece can be carried by one man on a frame work of wood or metal forming a sort of hod, which is so constructed as to serve as a mount for the gun in action. It is asserted that one artillery man or properly trained cavalry or infantry soldier can mount the gun ready for use almost instantly and that its service requires but one man.

The new mitrailleuse can fire 600 small-caliber projectiles per minute, equaling the performance of 25 or 30 men, and this can be maintained for a considerable time. Officers who have witnessed the trials executed by direction of the French authorities express the opinion that the use of the new weapon would be extremely advantageous in cases where a cavalry force was suddenly required to hold or attack a position against infantry. Should further tests continue to prove satisfactory the issue of some of these guns to certain cavalry corps is said to be contemplated, in order that they may be subjected to trial under ordinary service conditions.

Comptroller Myers of New York was disappointed last week when he learned that his proposed loan of \$1,000,000 was subscribed for only in part and that none of the offerings were for more than par. It is said that investors are a little afraid that new schemes involving \$5,000,000 for a gentleman's driving boulevard, \$10,000,000 or \$12,000,000 for a new city building, nobody knows how many millions for a rapid transit system, and \$7,000,000 or \$8,000,000 for the completion of a water system that would supply a city of 10,000,000 inhabitants, will overburden the city, and, to a certain extent, the credit of the city is affected.

At a grand union meeting of the Brotherhood of Locomotive Engineers in the Northwest, held at Ironton, Mo., Chief Arthur made the closing address, and spoke enthusiastically of the advancement in the condition of the locomotive engineers brought about by the work of the Brotherhood.



COMPOUND AIR COMPRESSOR.—SECTION THROUGH AIR CYLINDER.

a single valve. This plunger is, of course, stationary, and is carried by standards and cross beam, attached to main cylinder. The discharge connection between compressor and main air receiver is made by piping from the top of the stationary plunger.

The operation of the machine is so obvious that only the briefest description is needed. During the upward stroke of the piston, the suction valves $q q$ open and admit air to the full volume of the cylinder. As soon as the motion is reversed

pumps is sprayed against the air during the compression stroke, and absorbs a very large percentage of the heat of compression. This, in connection with water in the cylinder jacket, serves not only to prevent overheating of the cylinder and working parts, but also to greatly increase the capacity and economy of the machine, by preventing the expansion of the volume of air and a corresponding pressure, which would become a dead loss as soon as the temperature became reduced to the normal degree. The injected water also insures

WORLD'S FAIR NOTES.

Description of Machinery Hall.

In exterior design, says the *Chicago Herald*, Machinery Hall is more than merely grand and imposing. It approaches the gorgeous in architecture, and the general effect of the towers and exterior ornamentation is magnificent. The main building is 850 feet long and 350 feet broad. The interior looks like three large railroad train houses side by side, each spanned by arched iron trusses 125 feet long and 50 feet on centers. Outside of the main hall there is an immense annex, opening directly into the main building. In each of the four corners of the main building is a domed pavilion with a grand staircase. The main entrances are on the north and east sides, with many other entrances along the sides and ends of the main hall and annex. The power plant is on the south of the main building, in a one-story structure which runs the whole length of the building. The ornamental work of the exterior shows the purpose of the building, the statues and portraits representing mechanical forces or great inventors.

Exhibits are being daily installed in Machinery Hall. Three avenues or aisles run the entire length of the main building and annexes, the center one 25 feet wide and the sides each 15 feet wide. Tracks of auxiliary railroads are connected with these aisles and heavy machinery is being taken to its allotted space by means of immense traveling cranes. With a knowledge of every detail of the machinery exhibit, Chief L. W. Robinson is rapidly bringing order out of a chaos of incomplete details. Major Robinson brings to his task not only the discipline of a Government naval officer, but the valuable experience gained as assistant chief of the machinery department of the Centennial Exposition.

The Centennial Exposition created an epoch in machinery exhibits at international fairs. Compared with the Centennial Exposition the machinery exhibit of the coming World's Fair will be full of surprises. While the area for exhibits of machinery has been increased—it was about 14 acres at the Centennial and is about 16 acres at the present time—the amount of available space for domestic exhibits is somewhat less. At the centennial there were 337,000 square feet devoted to American exhibits. At the World's Fair this year the space given to American exhibitors is only about 220,000 square feet.

But while domestic exhibits have been curtailed in space, the World's Fair management has been generous to foreign exhibitors. At Philadelphia the various foreign governments occupied, all told, about 83,000 square feet of space. At Jackson Park they will have a gross space of about 175,000 square feet.

Other comparisons with 1876 are still more striking. At the Centennial Machinery Hall the main power plant was a Corliss engine, 50 x 50 feet. At Jackson Park there will be an electric power plant of 20,000 horse power, covering an area of 112,000 square feet. At the Centennial there were a number of annexes outside of the regular machinery exhibit which contained many exhibits of machinery in operation. At Jackson Park the entire machinery exhibit is massed together, and the limited space has made it a more select exhibit than that of any previous fair. Between three and four hundred applicants for space were turned away, although their exhibits would have been more than up to the 1876 standard.

While the area for mechanical exhibits at the World's Fair is limited, the general display, taking all the groups, will show

not only an advanced character of machinery, but finer workmanship in details. The number of firms making the same kind of machinery has vastly increased since 1876, and the competition is greater. In 1876 there was only one firm besides Corliss, in America, manufacturing those great engines that were then a marvel. To-day there are nearly 60 firms making them. In 1876 there were only four or five firms making steam pumps, including Worthington, Knowles, Blake and others, and these were mostly east of the Alleghenies. To-day there are hundreds of firms making steam pumps in almost every State and Territory. Chief Robinson had applications from 74 pump builders for space, of which 43 assignments have been made. The comparison of progress is true as to wood-working and machine tools and printing presses. The average space for individual exhibits at the Centennial was 244 square feet. At the World's Fair the assignments of space are less in number, but the space to each exhibitor is greater, nearly an average of 500 square feet. All the leading machines that are entered at the World's Fair are much larger than those made in 1876, and their variety is greater. To make a comparative exhibit between them a much larger space is required. The largest exhibits at Philadelphia occupied from 1200 to 1600 square feet. At the World's Fair Machinery Hall the largest exhibits will take from 2000 to 3000 square feet.

The general plan of the World's Fair machinery exhibit is simple. The whole exhibit will be on the floor of the main building and annexes. The only gallery space will be given up to restaurants, offices and lavatories. Foreign governments have the choicest location on the main floor. The foreign exhibits begin with those of Great Britain and Canada at the east end of the building and extend west nearly its full length.

The details of the foreign exhibits are in some cases yet incomplete, but the various commissioners promise that everything will be ready by May 1. In the German exhibit the Siemens & Halske Company of Berlin will construct a 1000 horse power engine and electric dynamo, which will furnish additional light for the Machinery Building. The countries from which the most prominent foreign exhibits will come are Canada, Belgium, Great Britain, Mexico, Russia, France, Spain, New South Wales, Italy, Sweden, Austria and Brazil.

The domestic exhibits will be from firms or individuals, there being no groupings by States in this department. The domestic exhibits will be located in the annex and in a portion of the west end of the main building. They will be grouped, as far as possible, in classes, so that a visitor in one part of the building may see in a single department the principal devices in which he is interested. Thus the machine tools, the machinery for fabrics and clothing, the wood-working machines, the printing and typesetting machines and all the other special classes of machinery will be located by themselves.

Of the unique exhibits in Machinery Hall it would take a volume to tell the story. There will be a superb display of machines for the manufacture of paper boxes and kindred exhibits. In the manufacture of textile fabrics the cotton, woolen and silk looms will be of wondrous variety and nicety of detail. The leading exhibitors in this department are the Knowles Loom Works, the Lowell Machine Shops and the Crompton Loom Works. These concerns will show the actual process of making cotton and woolen goods. Silk looms in full operation will be shown by the Atwood Machine Company, Schaum & Ullinger and others, the machines being operated by the Phoenix Mfg. Company of Philadelphia. There will be a

fine display of Jacquard looms, which will weave intricate designs of the World's Fair buildings and portraits of prominent men on silk.

There will be a vast product from the hundreds of machines in daily operation in Machinery Hall. Quite a number of concessions for the sale of the more unique products have been given. Those firms that have not obtained concessions will remove their product from Machinery Hall at the close of each day during the exposition.

There will be an interesting exhibit of sewing machines by the Singer Mfg. company, the Standard, American and other works. There will also be shown some special machines of this character, such as a carpet-sewing machine, where the operator rides a velocipede for 100 feet and guides an electric motor, which sews the carpet together as he moves along. There are also machines for sewing wood and leather with wire thread, some of the product being fine enough for a kid glove. Devices of this kind will be shown by J. H. Sternbergh & Co. of Reading, Pa. Several exhibitors will show the latest varieties of knitting machines and cloth cutting machines.

In the northwest corner of the building will be a large display of flour machines from the works of E. P. Allis & Co., Milwaukee; Barnhart & Leese, Moline, Ill., and Nordyke & Marmon, Indianapolis. Flour-mill machinery will be shown in full operation. The display of wood-working machinery will include exhibits by J. A. Fay & Egan Company, S. A. Woods Machine Company, Greenlee Bros. and others, and will be the largest display of turning and planing machinery ever shown. There will be carving and molding machines. One machine will carve out from wood intricate designs and statuettes in groups. In ancient times this kind of work was laboriously performed by hand, and months were spent on a single group. A machine exhibited by C. L. Goehring of Allegheny City will turn out four or five groups of wood statuary in the space of a few minutes. There will be a great variety of machines for geometrical moldings, which are now adopted in the manufacture of furniture and house decoration. These machines have only been on the market for two or three years, and some have recently been sold in Europe for \$25,000 each. Large exhibits of machine tools will be made by the Pond Machine Tool Works, William Sellers & Co., Nile Tool Works, and many others.

There will be shown a machine for measuring out and weighing coffee. This machine takes coffee from the hopper and fills 1-pound paper bags, seals them, and does this at the rate of several tons of coffee per day. This exhibit is from Arbuckle of New York City. There is another machine that manufactures tags and labels. It takes the paper from the roll, cuts the tags, prints the labels, punches the eyelets and then inserts the wire for fastening. Another machine makes different sizes of nails from wire. In 1876 the wire nail industry had not begun in this country. There were four or five crude machines shown at the Centennial by French exhibitors. These were purchased by Americans, and since 1876 the manufacture of wire nails has become general in the United States.

Among the exhibits will be machines for expanding metal for use in railings and galleries. A bar of steel goes in at one end and comes out a broad network at the other. This material is largely used as lath in the construction of modern buildings. There will be machines for making hooks and eyes, steel fence posts, sections of telegraph poles and chains. There will be an exhibit of machines for polishing lenses, so that persons who wear

eye-glasses may have lenses polished and mounted while they wait. The C. W. B. Sheridan company will make a fine display of wood-embossing machines that will make wooden medals, with impressions of World's Fair buildings, for souvenir purposes.

At the junction of the main hall and annex will be a tank of water 150 x 50 feet. Grouped around this tank will be the pump exhibit. Scores of modern pumps will take the water from the tank and throw it back again. The De La Vergne Refrigerator Company will build an ice grotto over the tank as an ornamental feature, this being one of the most spectacular features of the whole exhibit.

Another popular exhibit will be the large traveling cranes. These are three in number, operated by electric motors and covering a space of 75 feet over each main aisle. Until the opening of the fair they will be used for installing the heavy machinery exhibit. After May 1 platforms will be built on them and they will be used for carrying passengers. A balcony across the west end of the building will be the landing place. This balcony will also be reached by two elevators, which form a portion of the exhibit by the Crane Elevator Company of Chicago.

Some exhibitors will combine to make a collective exhibit. One instance will be on the south side of the annex, where a large paper mill will be in full operation. About 30 individual exhibitors will be included. Wood pulp will be put through all the processes of a complete paper mill. This exhibit is managed by the Paper Trade Club of Chicago, under the personal direction of Chief Robinson.

Another collective exhibit will be the great display of printing presses that will turn out the morning and evening papers for sale on the World's Fair grounds. There may also be an arrangement among the printing-press exhibitors and bookbinders that will allow the official catalogue to be printed in Machinery Hall. Hoe, Scott, Potter, Goss and all the other great press makers will be represented. There will also be a large exhibit of lithograph printing machinery, job printing machinery, bookbinding machines and linotypes.

The great power plant in the South annex will be a stupendous exhibition of mechanical energy. There will be about 43 steam engines, with a total of from 18,000 to 20,000 horse power. These will operate 127 dynamos, which in turn will produce electric light and power for all the other World's Fair buildings. For the power in Machinery Hall alone there will be 10 or 12 engines, representing a total of about 3000 horse-power. One engine alone in this gigantic power plant is nearly a third larger than the famous Corliss engine of 1876. The largest engine in the World's Fair power plant is built by E. P. Allis & Co. of Milwaukee, and is of 2000 horse-power, as against the 1400 horse-power of the Corliss. One thousand horse-power engines in the World's Fair plant are numerous, one being furnished by Fraser & Chalmers of Chicago.

The dynamos in the power plant, including Edison and all the leading makers, are classed in the electricity exhibit. The boilers are a part of the machinery exhibit, all the leading American makers being represented. There will be about 18 or 20 feed pumps in connection with the boilers, and these, with the large circulating pumps, are also classed as exhibits.

Expense of Fair Exhibits.

"It will cost as much to make the exhibits in the World's Fair buildings as the buildings themselves cost," Director-General Davis said last week in talking of the preparations for the opening May 1.

The rivalry of competitive firms in their exhibits is sharp all over the country, and even extends to foreign countries, where they are to meet on common ground. So keen is this feeling in the wine exhibits of France and Germany at the Horticultural Building that only the barest details are divulged, even to the fair officials. Everything is being held until the last day before work must commence. Each is afraid the other will get an inkling of what the exhibit is to be, and either imitate or improve on the original plan.

But it is among the big Chicago firms that the rivalry is the sharpest of all. Plans prepared by the architects are kept well secured in the vaults until time compels that they go into the hands of the builder. The same secrecy is observed by the builder.

When it is considered that exhibits costing from \$20,000 to \$30,000 will be numerous, particularly in the great Manufactures Building, all this precaution is not surprising.

"I would give a good deal to see the plans of the other firms in the trade," one prominent exhibitor said last week. "It would be a big help to us in knowing what to do in particular lines. There are three or four fellows I would outdo if it took my last dollar for advertising the next year."

While the fear of imitation is strong, it is not so generally pronounced as the idea that competitors will endeavor to see all bets and go one better in the game. The men who have charge of the exhibits for the big firms are lying awake nights just now to think of new effects and new combinations for their pagodas and material. A good idea is highly prized and no time is lost in getting it materialized. But these good ideas are guarded religiously.

The total expenditures of Chicago people in their private exhibits are estimated by those well situated to know at about \$2,000,000. Director-General Davis' figure that the private exhibits in the main buildings will equal the cost of the buildings is not believed by the chiefs to be excessive.

Every design for booths, pagodas, and pavilions must be sent to the fair officials and passed upon before active building begins. The purpose of this rule is to secure congruity in the grouping. Were every exhibitor left to follow his own aim the individual display might be unexceptionable, but strange and wondrous combinations would be made. Some of them would be quite ludicrous.

This same rule was followed with the buildings throughout the grounds. Every design had to run the gauntlet of criticism in the office of Director of Works Burnham. Few passed without material changes. The number of domes which met their fate at the hands of these critics is said to have been astonishing. Had no such paternal scrutiny been exercised, the collection of domes in Jackson Park and along Midway Plaisance would have been unparalleled in the world's history. It would have been also the laughing stock of architects, regardless of nationality or creed.

The perspective view of the fair has never been lost sight of. The buildings were looked upon as component parts of the whole. The picture of Jackson Park was to be without the blemish of incongruity. And it is.

The interiors of the great buildings are now being treated as a whole. Wide diversity is allowed in the structures to be there erected, but every exhibit is regarded as an integral factor of the whole scene. Some complaints have arisen from the exhibitors, but they are neither numerous nor serious. The reasons for changes are made so plain that a ready acquiescence most generally follows.

Just now exhibitors are being hurried

up to send in their designs in order that they can be passed upon at once and returned. While work on many of the pagodas is already under way it will be the middle of March before construction will be commenced generally. April will be the busiest month for this kind of work. With most of it everything possible is prepared at the factories in order to minimize the work at the parks. A fortnight will cause a transformation scene in the big buildings, when the structures begin to fly together. The bad weather has not retarded the interior construction alarmingly thus far, and there are no fears about it not being completed in time.

First Broad-Gauge Locomotive.

The "Lord of the Isles" came to Jackson Park last week. Unlike the "Pioneer," that veteran of the Chicago & Galena Railroad that ran into the park the day before under her own steam, the "Lord of the Isles" came on a flat car, in boxes bound with strong iron hoops. The old locomotive is sent by the Great Western Railway of England. It was the first broad-gauge locomotive built in England. She ran out of the shops in 1851, and was one of the star attractions of the World's Fair at London in 1851. The Great Western Railway will make an extensive show at the fair. Seven carloads of exhibits came in one day from that road.

A Novel Feat in Engineering.

An unusual feat in engineering was tried at "The MacKaye Spectatorium" one afternoon last week which served to attract the attention of all the mechanical engineers and builders at Jackson Park. The attempt was made to lift into position, from the ground to a height of 160 feet, an immense steel roof truss which weighed entire about 30 tons. Usually such a truss is placed in position a piece at a time and then riveted together, but this was impossible owing to the peculiar construction of the Spectatorium, and the truss was riveted together on the ground and lifted to its altitude by an immense two-arm derrick. Despite the predictions of failure which were made by the engineers and others the attempt was a success, and all the other trusses, about 150 in number, will be placed in position by this same derrick. The truss thrown into position first is the lightest one that will be used, the heaviest of the series weighing fully 20 tons more than this one.

The Wellington Catering Company, who control the restaurant privileges at the fair grounds, have just closed a contract with the Rogers & Hamilton Company for the entire silver-plate service required. This is probably the largest order ever given for knives, forks, spoons, &c., calling for 100,000 knives and forks, 200,000 spoons, and everything else in proportion.

The German Commission has received 116 cases of exhibits for the German chemical section. The entire lot weighs 50 tons and is valued at \$13,000. The Post Office Department of Germany has forwarded 25 packages for the post office exhibit.

The municipal authorities in Philadelphia have initiated a movement to abolish cable railroads in that city and substitute electric trolleys. One of the local papers says that "in comparison with the electric system, the lumbering, jerking cars of the cable roads are not much better than the obsolescent horse cars."

In the House of Representatives, 28th ult., the bill was passed establishing a standard gauge for sheet and plate iron and steel. An amendment was adopted on motion of Mr. Springer, providing that nothing in the bill shall be construed to increase the duty on any imported article.

A Wire Belt Lacing Machine.

J. H. Sternbergh & Son of Reading, Pa., are putting on the market a wire belt lacing machine. The working parts consist of three grooved rolls, with one gear on each and two idler gears. The upper lever acts on the back part of the machine, which is designed to serve as a vise, and the crank operates the rolls during the process of stitching or lacing. The parts most liable to wear are provided with an adjustment to compensate for this. The machine occupies about 1 square foot of floor space.

The mounting of belts in mills and factories has hitherto been the work only of skilled mechanics, while with this machine the work can be done by anybody. The belts are stitched by means of coiled cast-steel wire, and the process is very simple. One end of the belt is squared and placed in the machine, so as to touch the near roll and is firmly secured by means of the vise. A needle, made of coiled cast-steel wire, with pointed ends, is next run through the machine, so as to pass through the belt, thus making the holes for the stitches. A right hand coil of wire is then passed into the machine and through the belt and left in position; in the same manner a left hand coil is passed through the other end of the belt. Both ends are then flattened in the vise to match the thickness of the belt and the two ends are joined by running a small piece of straight wire through the coil, as shown in the cut of a laced belt, when the lacing is complete.

The makers claim a good many points in favor of the use of this machine. The holes in the belt are merely pierced, no part of the belt being cut or punched away, therefore allowing of equal distribution of the strain across its whole width; a lacing is quickly made and results in a strong and durable joint which will not pull apart under severe work; the lacing presents a smooth and even surface and the belt can be run with either side to the pulley; fragments of belting however small may be utilized in repairing belts; in fact, a complete belt may be made of small pieces, as shown in the engraving.

As an experiment, the makers of the machine made a belt 5½ inches wide, out of small pine wood sections 1½ inches wide, stitched together on this machine. They ran the belt on a fan, built for 4 horse power, for four or five days, and it did not show the least sign of pulling apart. This is the more remarkable as we are informed that the stitches ran with the grain in the wood.

The machine is made in three sizes, to suit all belts up to 20 inches wide and less, and is supplied with sufficient wire to lace 1000 inches in width of belting.

It is said that the Government Board of Ordnance has agreed to go to Syracuse, N. Y., in the near future and witness a test of the shell for carrying high explosives invented by Edward Lefever and John Bremner. It is understood that the inventors have promised to discharge 20 shells, ten containing dynamite and ten containing nitro-gelatin, from a navy gun, and that Mr. Lefever and Mr. Bremner will stand at the breech of the gun when it is fired. The gun that has been secured is about 9 feet long and has a 6 inch bore. It has been set up at Onondaga Valley, near the old arsenal.

The colossal "traveler" to be used in the construction of the new train shed for the Pennsylvania Railroad in Philadelphia interests many spectators. It consists of heavy beams of wood and iron to afford temporary support for the trusses while in

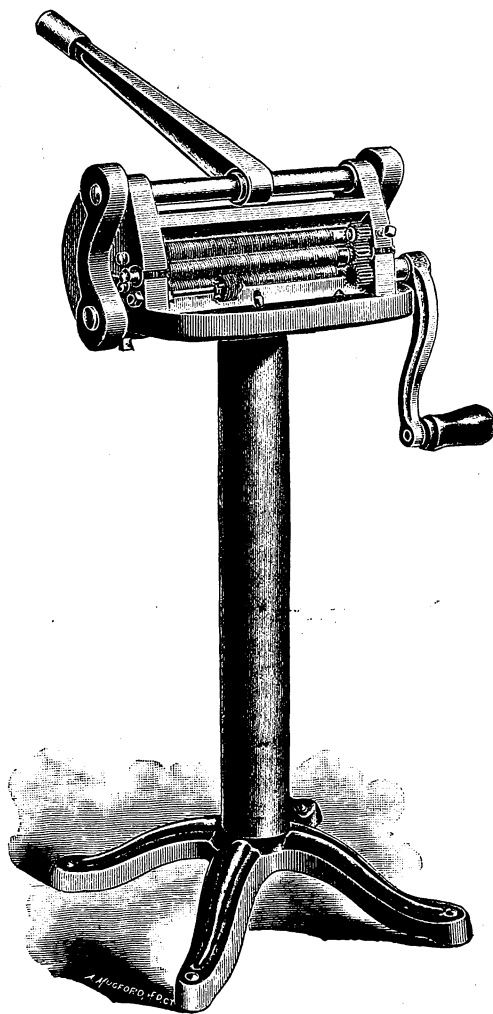
course of erection and it will be shifted along until the entire roof is finished. The shed when completed will be the greatest railroad shed span in the world. It will be 165 feet above the curb to the center of the lantern, 300 feet 8 inches span from the center of the pins, and 600 feet long. There will be 20 trusses in the roof and about 3000 tons of iron. The shed will contain 16 tracks and will have standing room for more than 200 cars.

The Foundrymen's Association.

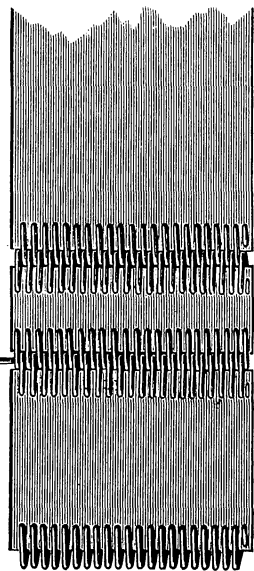
The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club, in Philadelphia, on

of the association may know the actual market price. The committee are also to endeavor to get the respective foundries making the same class of castings together to talk over the possibilities of improving their condition, in the hope of effecting an ultimate arrangement for procuring better prices. The cutting of prices and the ill feeling existing in consequence was a serious bar to legitimate business.

P. D. Wanner of the Mellert Foundry & Machine Company, Reading, Pa., cast-iron pipe manufacturers, in the course of the discussion, said that cast-iron pipe was being sold at ruinously low prices; lower than it had ever been sold before. During the panic of the '70's the cast-iron pipe trade held its own exceedingly well



MACHINE FOR LACING BELTS WITH WIRE.



Belt Laced with Wire.

Wednesday evening, March 1, with a large attendance of members.

The Executive Committee reported that the subject of coke for foundry use was an important one, and it was their wish to continue the discussion and invite representatives from different sections of the country to instruct the foundrymen regarding the adaptability of coke for fuel in the cupola in comparison with coal. The address by Jones Wister (reported in *The Iron Age*, February 2) has been largely appreciated, and a number of letters received by the Secretary asking further information. Nine new firms were elected to membership in the association.

A discussion then took place in regard to the forming of sections in the association, according to the kind of casting made. There are seven or eight branches of the foundry trade, and a committee representative of each branch has been appointed for the purpose of reporting the current prices for castings, in order that members

until 1877. In 1877 the prices broke, and in 1878 particularly so. Then came the rise in pig iron, and the pipe trade was interfered with; but during that depression, lasting two or three years, part of 1876, 1877 and 1878, it swamped or seriously embarrassed nearly all the pipe founders then in business, and the pipe was sold at the lowest prices then ever approached. The regular class of pig iron was sold at the same price as now quoted, and Northern iron was to-day very close to the price of 1877 and 1878. He drew attention to the depression in the pipe trade experienced for nearly five years, since 1877, and referred to the prices as being so very low that everybody in the trade should cease selling. He believed that during the last five years of depression there had been almost enough work to go around. If some of the other pipe manufacturers had taken the course he did (he had three pipe foundries and closed two of them) they all would have

been able to get good prices; but he considered that some in the trade were simply running the business for the love of it. There was a letting recently in which there were four bidders. He was informed that three of them struck as low as they dared—probably the danger line—and the one taking the job went from \$3000 to \$3500 below that. He was of the opinion that the appointment of a trustee was in order for a man putting in such a wild bid; any person in any trade committing such an act was incompetent for business. Sometimes a man running in a special line might bid low, as it was necessary for him to keep one or more of his shops running. In emergencies like these a man could to some extent be excused. But there was no emergency in the case he had mentioned. He admitted that every one in this country who was down to cost, and had been selling at cost for some years, should stop. A concern could not live by selling at cost. A profit must be made in a business if a living was to be taken out of it. There were emergencies which would occasionally occur, such as awards of damages to workmen, fires, bad debts, and others. These could not be met if business men figured to sell at cost.

George P. Smyser of E. G. Smyser's Sons of York, Pa., said that in his opinion it was best not to get reports on prices at present, but to get the different lines represented in the association together. Personally, he would first attach himself to the section covering architectural work, and afterwards to any other section in which he was at all interested. As an example of the low prices of accepted contracts he instanced the offer to him of a contract for iron columns if he would take it at \$1.60, but he promptly refused. He afterwards learned that the contract was given out at \$1.47½ for delivery alongside building. In his opinion the sooner an understanding between manufacturers was arrived at the better for the whole trade. He did not mean that, in making up the sections for committees, they should become separated from the association, but that the sections should act as committees and report to the association as a body.

S. C. Flagg, Jr., of Stanley G. Flagg & Co. of Philadelphia, thought it would be in vain for any one to attempt to give, for the purposes of the association, any prices, except on castings in specified classes of work. He had hoped to get from the committee an expression of the different prices at which certain castings could be sold. He considered that if a foundryman had no method of calculating his cost an unsatisfactory price could only be the result. Everybody must have an idea as to the amount of profit desired to be gained, and if costs were known it was easy to put the profit on them, and thus make a basis on which to compare prices with costs. When a man in the jobbing business mentioned what he got for his castings the information was valueless. In the matter of car work he found he could not compete with the prices in the West. He had asked a concern in Detroit what they would make castings for, and was quoted 3.25, delivered in Philadelphia. He had seen quotations on iron pipe and had been surprised at the difference in them, from 10 cent to 1½ cent. He thought that for association purposes prices of certain kinds of work might be of use, as he did not believe that two foundrymen in the same town and on the same class of work could differ much in costs. It was his opinion that many quotations showed an utter ignorance of costs.

The president, C. Schuman, was of the opinion that if iron pipe is made for 1 cent and other regular goods for nearly 1 cent less than in Philadelphia, it seemed high time for concerted action in the different branches of the trade. He thought each member should unite with the other mem-

bers in his particular line and form a section, and promised that as regards his own line it would be done within 48 hours. He urged that mutual push would accomplish much, and expressed his belief that no one would get excessive prices at this day, for if they did other foundries would go into the business.

Justice Cox, Jr., stated that history generally repeats itself. He had no doubt some of the gentlemen present remembered the association of wrought iron pipe men in this country, especially in this city and in Pittsburgh. A few years ago it was the most profitable business in the United States. There was an association that fixed prices, and it held together for 10 years, and represented the most successful people in the iron business in the country. To day they were the most unsuccessful. They were selling lap-welded and butt-welded pipe at prices that would astonish any man in the same business 10 years ago. These people were at the present time cutting each other's throats, and they numbered only 21 concerns in the whole country. He drew attention to the manufacturers of rails as representing the most successful iron and steel workers of the day because they had an association. All knew that if they wished to buy rails in Chicago they were \$29 for 50-pound rails and heavier, and if in Baltimore, the same price, as also in Steelton or Johnstown. He considered that the foundrymen were doing right in forming this association. As was well known, there were only a few concerns making columns, and comparatively few making pipe, and it would be a simple thing, with a little push and determination, to make an association a success and a means of material help to all. He belonged also to the Plate Association of Pennsylvania, which had had several meetings and had succeeded in getting prices to a fair profit until one of the large concerns in the vicinity went into a special kind of steel manufacture and lost a great deal of money, the result of which he thought all knew. That business is now in the same condition as the lap-welded pipe business. Everything in this country pointed to associations or to understandings that they should all make a little money. Through the Foundrymen's Association he believed better prices could be arranged, as there would be just as much business at higher prices as at lower. For purposes of information he would instance the method adopted by the wrought-iron people a few years ago. When an inquiry was out for a lot of iron pipe for a pipe line, the different concerns would ascertain when it was out and would all bid. The tonnage would then be divided among them, equitably, according to capacity for small and large work, thus holding prices and giving all concerns work enough to keep them busy. He explained the application of similar methods to the foundry business. He said that the association of the wrought-iron people collapsed through greed. They advanced their prices to such an extent that a concern went into the business at Catasauqua, and when the factory was half built the association bought him out at a ridiculous price. Another concern started at Chester, but the association this time decided to close it out, and this proceeding kept others out of the business and proved that low prices were their best protection. In spite of all they grew from 10 to 15 concerns, until to-day we find 21, which number accounts for the position they are found in to-day. In conclusion, he advocated the formation of sections in the association and the adoption of a plan for the division of work.

Thos. Devlin of Thos. Devlin & Co.; Mr. Rebman of G. Rebman & Co.; Mr. Whitney of A. Whitney & Sons, and others also joined in the discussion.

It was finally resolved that the price committee should be empowered to call upon other members to form sections in the different lines of the foundry business and report to the next meeting.

Treasury Decisions.

Drawback on Tin Shingles.

TREASURY DEPARTMENT, January 18, 1893.

SIR: On the exportation of tin shingles manufactured by the Cortright Metal Roofing Company of Philadelphia, Pa., from imported tin plate and paint of domestic production, a drawback will be allowed equal in amount to the duty paid on the tin plate used in the manufacture, less the legal deduction of 1 per cent.

The quantity of the imported material so used shall be determined by allowing 96½ pounds of tin plate for every 100 pounds of the exported shingles. Respectfully yours,

O. L. SPAULDING, Ass't Sec'y.

COLLECTOR OF CUSTOMS, Philadelphia, Pa.

Steel-Ribbed Cylinders, or Boiler Flues or Tubes.

TREASURY DEPARTMENT, January 25, 1893.

SIR: The Department is in receipt of a letter dated December 30 last from the United States Attorney for the District of Delaware, in which he reports the trial before Judge Wales, in said district, on November 30 last, of a case arising on the application of the Collector of Customs at Wilmington for a review of the decision of the Board of United States General Appraisers at New York (G. A. 931) as to the dutiable classification of certain steel-ribbed cylinders, imported by C. W. Whitney on August 21, 1891, which trial, it appears, resulted in favor of the importer.

The facts in the case, as shown by the papers before the Department, are that the goods in controversy consisted of four steel-ribbed cylinders, each 9½ feet long, 45 inches in diameter, flanged at one end and weighing 3,104½ pounds, and were imported by the protestant by way of Philadelphia, per "British Princess"; that they were assessed with duty at the rate of 45 per cent ad valorem, as manufactures of metal not specially enumerated or provided for under the provisions of Paragraph 215 of the act of October 1, 1890, the importer claiming that the same were "boiler flues," and consequently dutiable at the rate only of 2½ cents per pound, under the revisions of Paragraph 157 of said act, for "boiler or other tubes, pipes, flues, or stays of wrought iron or steel;" and the case was taken to the Board of United States General Appraisers, under the provisions of Section 14 of the act of June 10, 1890, where the contention of the importer was sustained and the decision of the Collector reversed, whereupon the Collector appealed to the Circuit Court for a review of said decision, with the result as aforesaid.

The contention of the Government was that a "tube" was an article used as a conduit of the gaseous products of combustion, whereas the articles in question were not conduits at all, but places for actual combustion, and were therefore a species of furnaces, and, as furnaces are not provided for *eo nomine* in the act of 1890, the articles were accordingly dutiable at the rate assessed as unenumerated manufactures of steel; that similar articles had been classified at the rate of 45 per cent. ad valorem without protest; that the method of construction, the material, cost and use are utterly different from that obtaining in the case of flues; that evidence was adduced to the effect that tubes used

as flues were cheaper in price than the articles in question; that such tubes were made by machinery, kept in stock and ordered and dealt in by wholesale, whereas the articles in question are always made to order and could not be kept in stock, could not be dealt in wholesale, but had to be manipulated and fitted by hand labor for the precise place and boiler in which intended to be used, while the importer claimed that the articles did not become furnaces until provided with certain fittings, such as grate bars, bridge walls, doors, &c.; in short, that the articles were flues of which a furnace was to be made, and not of themselves finished furnaces; and, as before stated, the court agreed with the importer's contention and sustained the ruling of the Board of United States General Appraisers, overruling the Collector and directing a reliquidation accordingly.

Upon submitting the matter to the United States Attorney-General, under the provisions of said Section 15 of the act of June 10, 1890, that officer advises this Department, under date of the 21st inst., that no appeal to the Circuit Court of Appeals would be directed in this case.

You are hereby authorized to take measures looking to a refund of the duty exacted in excess on the merchandise in question. Respectfully yours,

JOHN H. GEAR, Ass't. Sec'y.

COLLECTOR OF CUSTOMS, Wilmington, Del.

Bauxite or Hydrate of Alumina.

Before the United States General Appraisers at New York, December 13, 1892. In the matter of the protests, 24,332 a, &c., of Thos. Irwin & Sons and others, against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain hydrate of alumina or bauxite, imported per the vessels named and on the dates set forth in the annexed schedule. Opinion by Somerville, General Appraiser.

The merchandise covered by the protests in these cases is precisely of the same character. It is described in the invoices as "hydrate of alumina, or bauxite."

It was returned by the local appraiser as alumina, and was assessed by the Collector, under Paragraph 9 of the new tariff act, which reads as follows:

Alumina, alum, alum cake, patent alum, sulphate of alumina, and aluminous cake, and alum in crystals or ground, six-tenths of 1 cent per pound.

The Treasury Department recently referred a sample of the merchandise to the Collector at the port of Boston for investigation by him, and he reached a conclusion different from that attained by the customs officials at New York. He reported that the article was "refined bauxite," which is merely the crude bauxite of commerce, with the impurities of iron and silica removed, and unchanged in chemical properties.

The importers make the claim in each of the cases that the merchandise is exempt from duty under Paragraph 501 of the new tariff act, which enumerates in the free list "bauxite or beauxite." In two of the cases the additional claim is made that the article is dutiable at 20 per cent. ad valorem under Section 4 of said act as a non-enumerated manufacture.

On the hearing of the cases the testimony was conflicting, especially that relating to the chemical constituents of the mineral, or clay, known as "bauxite," or, as it is sometimes spelled, "beauxite." On this particular point the board was enlightened by the testimony of Thomas M. Drown, professor of chemistry in the Massachusetts Institute of Technology, at Boston, and of John H. Wainright, analytical chemist in the United States laboratory at the appraisers' department in New York, who were orally examined on the hearing of the cause. They both agree in the view that the mineral known as

"bauxite" is a hydrate of alumina, being a chemical combination of alumina and water, and usually containing silica and iron as its principal impurities.

The former, however, asserts that bauxite appears in the form of both a dihydrate and a trihydrate of alumina—that is, chemically combined in the proportion of 2 parts of alumina to 2 parts of water, and also of 2 parts of alumina to 3 parts of water. The latter maintains that bauxite chemically contains only 2 parts or equivalents of water, and is therefore only found in the form of a bihydrate, and that the article under consideration contains 3 equivalents of water, being a trihydrate, and is not, for this reason, in his judgment, the mineral known as "bauxite" or "beauxite." The whole difference in dispute in its chemical aspects is thus reduced to a single equivalent of water in the composition of the article in question.

The board makes the following findings of facts in the second cases:

1. The merchandise under consideration is a white mineral powder, resembling pulverized alum in appearance. The ac-

companying sample is a correct representative of the several importations.

(2) It is, chemically considered, hydrate of alumina, or alumina and water combined.

(3) It is known and dealt with in trade under the name of "refined bauxite," and differs from crude bauxite only in the fact that it has gone through a process of manufacture by which the impurities of iron and silica have been mechanically removed from the crude article.

(4) It is used for the same purposes as the crude bauxite—namely, for the manufacture of alum or aluminous product, such as the sulphate of alumina or alum cake.

(5) We further find that the article is refined bauxite, which is nothing more than crude beauxite with the impurities of iron and silica removed, without affecting the chemical composition of the article or its chief utility. There are samples of this mineral found in nature which are about as free from impurities as the refined article, and a trihydrate may be reduced through the application of heat to a dihydrate by the expulsion of an equivalent of water.

We hold that the merchandise is free of duty, under Paragraph 501, as "bauxite or beauxite."

The basis of this decision (we may add) rests on the principle often recognized by

the Department, that where an article is specified in the free list, without terms of limitation, such article is exempt from duty irrespective of the condition in which it is imported, unless the changed condition affects its commercial designation or the tariff law otherwise provides.

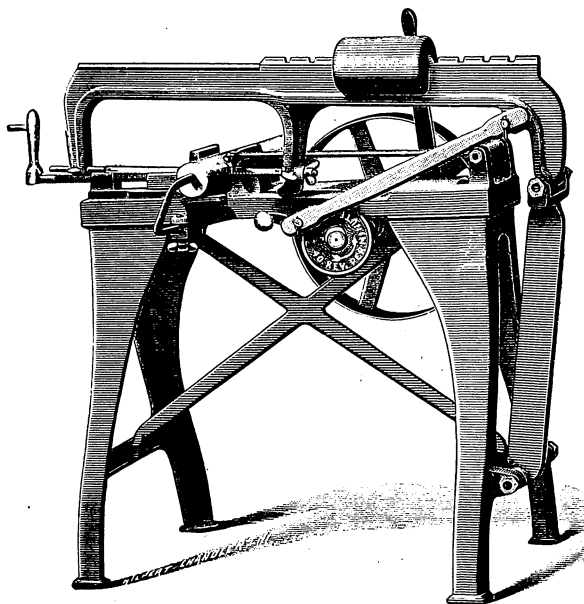
The protests are sustained, and the Collector's decision is reversed in each case. He is instructed to reliquidate the entries as required by law.

[Withheld for review by the courts.]

Mottled Enameled Ware.

Before the United States General Appraisers at New York, December 23, 1892. In the matter of the protests, 32,353 a, &c., of Hermann Aich, against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain mottled enameled ware, imported per vessels, and at dates named in schedule annexed. Opinion by Wilkinson, General Appraiser.

The goods are articles of sheet steel enameled. They were returned by the appraiser as enameled in more than one color, and assessed for duty at 50 per cent., under Paragraph 172, N. T., and are claimed to be



THE STOVER POWER HACK SAW.

dutiable at 45 per cent., under Paragraph 171, N. T. The enamel is of a stone or slate color with a mottled or marbled appearance. The enamel is laid on in one color and the mottled appearance is caused by the action of acids and heat.

We find that merchandise is not enameled or glazed in more than one color, and sustain the claim that it is dutiable at 45 per cent., under Paragraph 171, N. T.

The Stover Power Hack Saw.

The power hack saw here illustrated is made by the Stover Novelty Works of Freeport, Ill. The machine cuts any size or shape of metal up to 4½ inches, and is provided with a vise for holding the work to be cut. The frame carrying the saw is pivoted at one end to a bar journaled in the lower part of the frame. The upper bar of the saw frame is notched and adapted to receive the weight by which the pressure of the saw on the work is adjusted. It will be observed that, owing to the point at which the upper end of the pitman joins the saw frame, the pressure during the forward or cutting stroke is much greater than on the return. When the bar has been cut off the machine automatically lifts the saw from the work and stops.

The Bray Rolling Mill.

The rolling mill of which drawings are here presented was designed by Charles

Company of Canal Dover, Ohio, and others were constructed for the Joliet Sheet Roll Mill Company and for the Corning Steel Company of Chicago. The mill is

directly to the finishing rolls, whereby the set of pinions usually employed at one side of the set of balanced roughing rolls and connected to them is done away with,

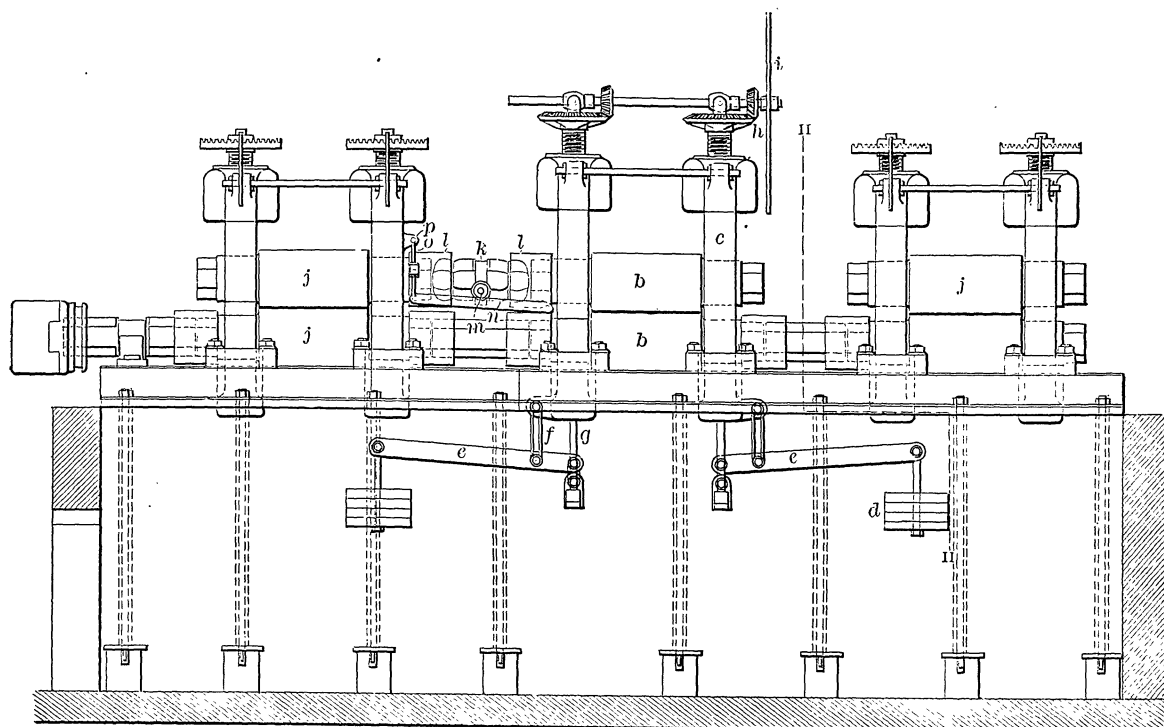


Fig. 1.—Front Elevation.

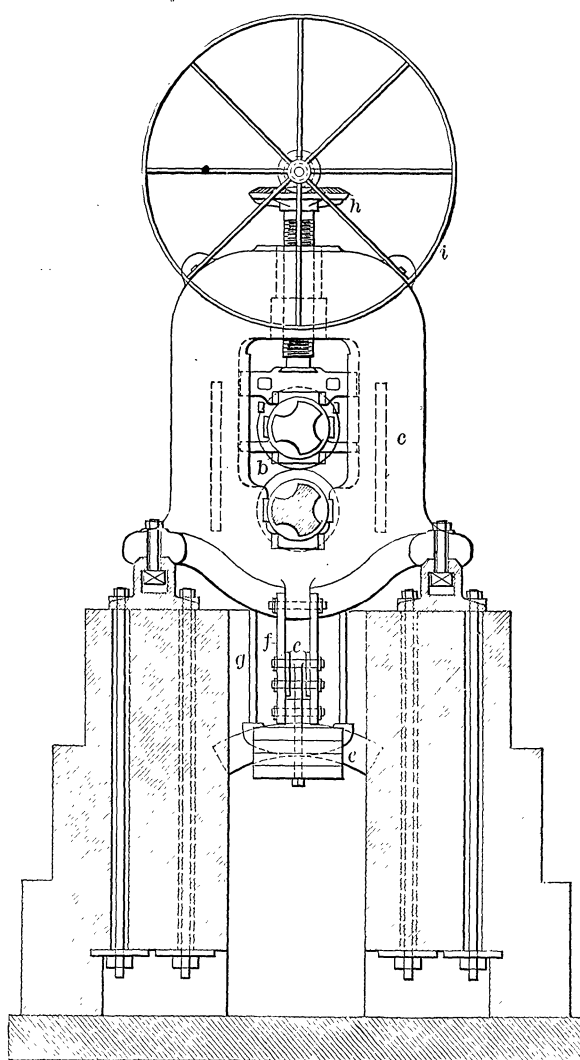


Fig. 2.—Cross Section.

THE BRAY ROLLING MILL.

W. Bray of the Lloyd Booth Company of Youngstown, Ohio. The first mill of this description was built for the Reeves Iron

intended for rolling sheets or plates from sheet bars or slabs. The construction is such that the roughing rolls are connected

and the upper roughing roll is driven from the frictionally-driven top finishing roll. The rolls *b* of the roughing set have the usual housings *c* and the counterweights *d*. These counterweights hang at one end of the levers *e*, which are hung by links, *f*, from the housings and are connected at their opposite ends to the rods *g*, which carry the upper roll bearing. These rolls are provided with lowering mechanism, consisting of the bevel gears *h* and hand wheel, *i*, the shafts of the bevel wheels being screw-threaded as ordinarily. In the same line with the roughing rolls are mounted the finishing or jump rolls *j*, the lower rolls of all the sets being directly connected as shown and driven positively by an engine connected to one of the lower finishing rolls. Between the upper roughing roll and one of the upper finishing rolls is provided a flexible connection consisting of the wabbler *k*, entering the sleeves *l* and supported upon a yoke carried by wheels, *m*, which roll upon bars, *n*, pivoted at one end to the bearing of the upper roughing roll and at their other ends to links, *o*, pivoted to lugs, *p*, projecting from the housing of the finishing rolls. The upper finishing roll is driven by frictional contact with the lower roll and the metal, and through the flexible connection drives the upper roughing roll. In practice this arrangement is found to be efficient in the highest degree, since as the metal is comparatively thin when passing through the jump rolls, the friction is sufficient to drive the upper roll and through it the upper roughing roll, which is raised a considerable distance from the lower roll in working, on account of the thickness of the bloom. It is only necessary to keep the top roughing roll turning until the metal enters, when the bottom roughing roll will drive it.

The advantages of this construction are obvious.

Fred. Douglas' ambition is to round out his life by establishing a grand industrial enterprise, and accordingly he has assumed the presidency of a manufacturing company near Newport News, Va., building a town and employing colored men. A cotton knitting mill will be erected.

Trial of the 14-Inch Harvey Plate.

The report made to Commodore W. P. Sampson, Chief of the Bureau of Ordnance, by Ensign R. B. Dashiell, inspector in charge at the Naval Proving Ground, concerning the recent trial there of a 14-inch Harvey plate, contains much of interest. It plainly proves the very high efficiency contributed to steel armor by the Harvey process of surface hardening. The firing, which took place in the presence of the Chief of the Bureau, was with a 10-inch breech-loading rifle, loaded with Holtzer projectiles, weighing 500 pounds each. The nickel steel Harvey plate was 14 inches thick, and very solidly and substantially installed with oak backing, to which it was bolted, 385 feet distant from the muzzle of the gun.

The first shot was with a striking velocity of 1472 feet per second. The projectile smashed on the face of the plate, its point and a small portion of the ogival being welded in the impact, while the rest broke into small fragments which flew to the sides and rear several hundred feet. The penetration was only about 2 inches, and the plate was not cracked, nor was the backing structure disturbed. While the pieces of the shell were very hot, the plate, even around the point of impact, was quite cool, and its face was not discolored at all. The shot had been delivered at the lower right-hand corner.

The second round was with a striking velocity of 1859 feet, delivered at the upper left-hand corner. Again the shell broke up, leaving a part of its head welded into the plate, but under the high velocity the surface scaled off from $\frac{1}{4}$ to $\frac{1}{2}$ inch in a rough circle around the impact. A thorough crack was opened, extending downward and to the left from this shot hole to the edge of the plate. A fine crack of unknown depth also extended from the hole to the right. The structure set back elastically about an inch. The plate at the shot hole was warm and the fragments of shell were very hot. The penetration was about 5 inches.

The third round was with a striking velocity of 1959 feet. The fragments of the shell, which struck the plate in the upper right-hand corner, flew in all directions, its head, which was very much upset, remaining welded in the plate. The circular scaling was repeated, and a thorough crack, a little over $\frac{1}{2}$ inch wide, was opened to the top, while another extended downward to the left. There were two fine cracks also half way through the plate, and the two cracks from the previous shot were widened. The structures and backing set back about 2 inches and recovered 1 inch, and one vertical timber was split off. But all bolts and fastenings remained intact. The estimated penetration was 6 inches.

The plate up to the third round had been an entire mass, resisting with its full weight each one of the three shots. After the third round it was divided into three almost equal fragments. The fourth round was directed at the center of the lower left-hand fragment, with the very high striking velocity of 2059 feet per second. This shot also broke up, with the head welded and the base and body in small pieces. The cracks already in the plate were considerably widened, and the piece which received the blow was broken into three fragments. The plate was broken into seven fragments, but all remained on the backing, no bolts having been broken. The two left-hand pieces of the piece above and to the left—that is, the upper left-hand corner of the plate—were thrown off to the left, both upward and downward; the right hand and larger piece was slightly displaced to the right and upward at its right-hand end; the remaining two thirds of the plate was apparently intact

and in its original place on the backing. The backing itself was uninjured, excepting that the great force of the blow actually compressed the timber immediately beneath the piece struck. The structure was set back bodily about 6 inches. The penetration was a little over 10 inches. Regarding the entire plate as the target for the reception for the first three shots, and the lower left-hand fragment as the target for the fourth shot, the following table of data is appended, the energy being given in foot-tons and the penetration in inches:

Rounds.	Total energy.	Energy per ton of plate.	Estimated penetration.
1.....	7,539.9	470.5	2 in.
2.....	11,995	749.7	5 in.
3.....	13,320	832.5	6 in.
4.....	14,715	*3,344.3	10 to 11 in.
Total.....	47,550.9		

*Weight of fragment attacked, 4.4 tons.

The conclusion of Ensign Dashiell is that the point of the first shell did not reach the interior limit of the Harvey hardening. Its effect was confined almost entirely to the hard face of the plate, and nearly all the energy of impact was absorbed in shattering and heating the projectile. The plate was cold throughout, there were no cracks, and the structure was not disturbed nor shaken. But when the higher velocities got the point in beyond the surface hardening the characteristics were different. More of the energy was absorbed by the plate and structure; more of the projectile remained welded and the fragments were larger, while the wedging and cracking effect was greater. No shot, not even the last, delivered with its very high velocity on a small fragment, got through the plate. The penetration in this last case was measured, but in the three previous rounds was only estimated. Ensign Dashiell accordingly draws these inferences, first as to the external aspect, or as regards plate and projectile, and second as to the internal, or as regards the supporting structure or ship:

Considered externally, the plate fulfilled the requirements of the ideal plate—it resisted and broke up four projectiles of standard armor-piercing qualities, fired with velocities varying from those that would obtain at the commencement of an action at moderate range to those that would be reached by a high-power gun at 100 yards or close range. It protected from all injury the backing upon which it was mounted, even under the severe conditions of the last shot, when a fragment less than one-third of the plate was attacked by the heaviest energy employed in the test, and the plate has shown itself more than a match for any 10-inch gun afloat.

Regarding the plate as a protection for a ship, more is to be considered than the mere breaking up of and perfect resistance to all the projectiles fired at it. The question of the absorption of the energy of the blow is the cardinal point in the case. Armor, if made thick enough, can stop any projectile; but the energy, if the projectile is not broken, goes into the plate, thence into the structure in rear, and the shock and racking effects are very serious. In the case of the Harvey plate, nearly all the energy of the blow went into the projectile in the first round, the percentage becoming less and less, of course, as the velocity increased; but even in the last round a very large part of the energy went toward breaking and heating the projectile. This plate was mounted upon the same structure and with the same structural resistance as the 14-inch nickel plate of the "Indiana." The weights of the plates were 25 tons to 16 tons in favor of the 14-inch nickel, and the striking velocity on the latter plate was 1384 feet per second, or nearly 100 feet per second less than that of the first round on the Harvey plate.

Yet the heavier plate was on each round set back and the structure was racked very much more than was the case with the lighter Harvey plate of the same thickness with shots of 1472, 1859 and 1959 feet per second.

As was to be expected, the last shot with 2059 feet at the 4.4-ton fragment of the Harvey plate racked very severely the backing and structure on that side, but it could have still stood against another round. The difference is due to the distribution of the energy—if into the projectile, the structure or vessel is but little racked; if into the plate, the structure suffers. These features were so clearly

shown in this test—more clearly than in any former trial—that I take this opportunity of bringing them prominently to the bureau's notice, and to respectfully offer the opinion that, from a naval point of view, the remarkable behavior and condition of the supporting structure are fully as important matters for consideration as their immediate causes; the projectile-breaking qualities of the plate.

The behavior of this 14-inch plate under striking energies so extraordinary adds one more proof to the now unquestionable fact that the armor to be carried by American battle ships is the very best in the world.

The Pottstown Iron Company.

At a meeting of creditors of the Pottstown Iron Company, H. F. West presided. The president, directors and receivers attended, and a majority of the creditors were represented.

The chair was instructed, on motion of Samuel R. Shipley, to appoint a committee of five creditors, to co-operate with the receivers as an Advisory Committee, for the furtherance of the best interests of the creditors and the carrying on of the business in conjunction with the receivership.

A detailed statement of the assets and liabilities of the company was submitted by John Sparhawk, Jr., counsel for the company, as follows:

Resources.

Real estate, blast furnace, rolling mills, factories and steel plant....	\$2,115,344.00
Personalty, including raw materials and those in the course of manufacture.....	358,689.20
The books of the company show, January 30, 1899:	
Accounts receivable.....	163,869.53
Bills receivable.....	3,722.66
Bills receivable discounted.....	140,501.11
Cash.....	23,884.68
Total.....	\$2,806,061.18

Liabilities.

Capital stock.....	\$184,800.00
Bonds payable, \$250,000 at 6 per cent. and \$374,000 at 5 per cent.....	624,000.00
Bills payable.....	791,205.47
(With part of these, \$246,000 of the general mortgage bonds of the company as collateral.)	
Accounts payable.....	118,345.82
Bills received discounted.....	140,501.11
Wages.....	29,049.28
Total.....	\$2,587,901.68

The obligation of the capital stock, \$884,800, is included, but subtracting it the sum due the creditors is \$1,703,101.68. A request was made that an Advisory Committee be chosen to act with the receivers.

A report submitted by the appraisers appointed by the court, James C. Brooks, president of the Southwark Foundry & Machine Company, and John L. Weimer of the Weimer Machine Works, Lebanon, Pa., says: A careful canvass of the value of the personal property and real estate shows it to be worth \$76,181 more than is shown by the books of the company. This result is arrived at after deducting the book value of the following properties, as follows:

Hoagwell property.....	\$46,173.54
Mount Pleasant property.....	3,722.65
Eshback property.....	522.50

Making a total reduction of..... \$50,448.69.

We noted in our investigations that the steel department was working very effectively. This, with the good condition of the rest of the works, leads up to the conclusion that it is of vital importance to the creditors to keep the works running, in order to recover the amounts due them, from the company.

We submit herewith a detail of the plant, with valuations annexed; also a schedule of the personal property showing its value as nearly as we are able to ascertain it.

We make plant valuation, including all:

Real estate.....	\$2,115,344.00
Personal property.....	358,689.20
Total.....	\$2,474,033.20

The officers of the company submitted the following statement:

"The works are in efficient condition. The plant has been in operation over 25 years and its products have a preference in many markets. Our sales last year amounted to \$2,735,000. The output during 1892 was: Pig iron, 38,561 tons; puddle bars, 26,977 tons; sheared plates, 24,233 tons; universal plates, 24,228 tons; nail plates, 13,134; nails, 198,736 kegs; Bessemer steel ingots, 48,409 tons; open-hearth ingots, 4625 tons; steel slabs, 42,275 tons. Notwithstanding the extreme depression in prices, the operations of the year involved no loss. The continued operation of the works will, it is believed, result in advantage to the creditors."

The Reading Rolling Mill Company.

The bill in equity asking for the receivership for the Reading Rolling Mill Company was filed by the Wellman Iron & Steel Company, George W. Bush & Son Company, Francis H. Saylor, James Boyd & Brother and L. C. Maderia & Sons. The action is entirely a friendly one, brought to conserve the company's property and business, and, it is thought, will last but a short time. The plaintiffs were represented by Henry J. McCarthy and the Reading Rolling Mill Company by Milton C. Work. The Commonwealth Title & Trust Company will act as surety for the receivers, who were required by Judge Pennypacker to furnish joint and separate bonds in the amount of \$125,000. Permission was granted the receivers to continue the business of the company, and all of the contracts now on hand will be carried out.

The property and plant of the Reading Rolling Mills are valued at \$562,539.40. The stock on hand in process of manufacture is placed at \$261,743.66, and there is due to the company in the shape of accounts payable over \$40,000. This makes the total assets nearly \$900,000.

The liabilities are as follows: Bills payable, \$217,312.48; accounts payable, \$18,000, and wages, \$8997.60. There is also a mortgage on the plant for \$50,000. The authorized capital of the company is \$500,000, but of this amount only \$300,000 has been paid in.

It will be seen that the assets are far in excess of the liabilities. The receivership was made necessary by the lack of ready money and by the difficulties in which Cofrode & Saylor, Incorporated, became involved.

A Large Rivet Contract.—Probably the largest single contract for rivets ever made in this country was placed a few days ago by Philadelphia's great shipbuilding concern, William Cramp & Sons, with J. H. Sternbergh & Son of Reading. The contract calls for over 500 tons of rivets required for cruiser "Brooklyn" and the sea-going battle ship "Iowa," lately contracted for by the Secretary of the Navy with Cramp & Sons, and about 2000 tons of rivets required for the construction of five or six big steamships for the Inman line, each of which is to be fully as large if not larger than the famous ocean greyhounds "Paris" and "New York" and all of which are to fly the American flag. These rivets are all to be of steel, some of one quality and some of another, adapted for use in riveting up the hull plates and for the boilers and other purposes, all to be of extraordinary quality. Some of the rivets must stand a tensile strain of not less than 55,000 pounds nor more than 62,000 pounds per square inch, and must stretch before breaking not less than 29 per cent. in 8 inches of length. If the rivets fall below or exceed this tensile strength they will be rejected.

They must also stand a shearing strain of at least 45,000 pounds per square inch, and must be subjected to hammer tests by flattening and bending hot and cold without showing the least sign of crack or flaw.

San Francisco News.

The iron and hardware business has improved considerably during the past week—in fact, ever since the rains ceased. Business has not yet assumed any considerable dimensions, but there is a better tone to the market and the prospects are improving every day. This is true of bar and merchant iron generally and hardware. As to pig iron, the outlook is not quite so favorable. There is a large stock on hand—that is, a large stock for this market—8000 to 9000 tons. Of this about 50 per cent. is American—that is, New York and Alabama—about 50 per cent. English and Scotch. This is being quietly got rid of at low prices, \$20 to \$22 per ton, and it is gradually passing out of importers' hands. In fact, they hold very little now. The American article is not selling quite so well, as it has gone off at \$19 to \$20, although a year ago the samples to hand were considered to be of very good quality. It has since come to hand in unusual quantity—over 6000 tons—and that has helped to depress the market. It was, however, a comparatively easy matter to depress such a market as that of San Francisco, demoralized as it has been by Eastern competition, strikes and general dullness occasioned by the unsatisfactory condition of the transportation problem. The heavy imports of Eastern iron have been promoted principally by the cheap freights from New York and these will continue to perpetuate a similar condition of affairs. There is, therefore, not a very brilliant outlook for the pig iron market, at least until matters improve a little. It is evident, though, that American iron would have the call in this market unless indeed, which is now almost absolutely certain, the duty on pig iron shall be removed. If so we will have English and Scotch iron here in great abundance and it will divide up the market equally with American. The removal of the duty would, it is urged by many leading men in the iron and steel industries, at once remove the advantage which cheaper labor and larger markets now gives the Eastern manufacturer and not only render us unapproachable in our own domain, but enable us to supply the coast with the greater part of the articles needed in iron and steel except those covered by special patents. The outlook for the foundry and machine business on the coast is therefore exceptionally good, though we do not expect the change to come immediately and may have to wait even a year for it, but the knowledge that it is coming will have a generally beneficial effect. It will serve to offset, too, the disappointment felt by the trade generally at the failure of the coast to receive contracts for any of the new war vessels. This has had the result of making times a little harder, because, as I already notified you, it seriously curtails the amount of labor employed in this business in this city.

Arrivals by sea of iron and metals for the past two weeks have been fair. They include 400 tons of American pig by the "A. G. Ropes," 142 tons by the "Umatilla," and 200 tons of foreign by the "Matri Bhan." The "A. G. Ropes" had also quite a large cargo of hardware, merchant iron, pipe, &c. Arrivals since the first of the year have been of very large volume.

We have received 2571 kegs of nails by the "A. G. Ropes," 2025 by the "Umatilla," and 2300 kegs by the "Tacoma," a total of 6896 kegs in two weeks, showing that the quantity of Eastern coming here is increasing. The market remains

very quiet at \$2.20 as the base price for iron nails.

Tin plate has been in fair demand at \$6 to \$6.10. We have had no further arrivals, and the market is likely to keep steady, as all the Alaska packers except two are in a combine and as the Columbia River packers, as well as those of British Columbia, are similarly circumstanced. There will not be any more need of salmon than there was last year, when the pack on the coast was in round numbers 1,500,000 cases; but the amount of the fruit and vegetable pack is always an unknown quantity. In 1892 it was given out that packers were only putting up one-half of what they had done in the preceding year, but now it is known that the pack was as large, if not much larger, than for the year in question; and, in fact, this is a factor that is not very safe to deal with. The consumption of tin plate has been much larger in 1892 than for a long series of years past, and it is safe to say that the consumption of 1893 will fully equal that of 1892.

Imports by rail for the past two weeks have been 48 cars, including 1 car of chain, 1 of elevator gates, 6 of iron, 7 of machinery, 1 of hardware, 4 of wagons, 4 of agricultural implements, 4 of stoves, 5 of pipe, 4 of sheet iron, 2 of shovels, 1 of safes, 1 of steel, 1 of ranges, 1 of plows, 1 of cable, 2 of lead cable, 2 of engines.

Apropos of the present financial situation, it may be of interest to such as are solicitous that the American dollar shall continue to be worth intrinsically 100 cents wherever offered, either at home or abroad, to know that in the West there is developing a revulsion of opinion quite in contrast with that so long current there, as evidenced by a communication lately received by U. D. Eddy of the Coombs, Crosby & Eddy Company from his brother, A. S. Eddy, cashier of the Corn Belt Bank, Bloomington, Ill. In his letter he says that gold, which had circulated freely in that section up to two months ago, has entirely disappeared; in other words, is being hoarded. He adds that the agricultural interests are watching financial channels in New York with considerable anxiety, and that customers of the bank are continually asking questions which show a deep seated interest in the consideration of measures bearing on the situation, quite the reverse of the feeling heretofore shown.

E. Lane, the engineer in chief of the new Central Railway in Peru, finds that the workmen, up to an altitude of 8000 to 10,000 feet, do about the same relative quantity of work as at sea level, provided they have been inured to the height or brought up in the country. At 12,000 feet the amount of work deteriorates, and at 14,000 to 16,000 a full third has to be deducted from the amount that the same man could perform at sea level. Owing to the absence of malaria, the percentage of efficient labor at the greatest elevation is a very high one. Men coming from the coast are not found capable of doing efficient work for about two weeks on an average when taken to high elevations. The capacity gradually increases and reaches its maximum in a few weeks or months, according to the constitution of the individual.

A board of army officers will assemble at Springfield Armory, 11th inst., to test American guns. Two new guns are ready for trial.

James A. Wright, agent for the Durango Iron & Steel Company, is purchasing material and machinery in Pittsburgh to be used in extensive improvements to the plant.

The Works of the Carbon Steel Company.

[With Supplement]

We present in the accompanying supplement a general plan of the works of the Carbon Steel Company, Pittsburgh, Pa., the company having been in business for about five years. The works are located in the very heart of the city of Pittsburgh and cover an area of about 8 acres of ground, owned by the company. That every square foot of room should be made as productive as possible is imperative, owing to the high assessed valuation per acre, and the importance of this fact should not be overlooked in considering the general layout. With the object of bringing the efficiency of their works to an equal plane with, if not higher than, their competitors, they have during the past year expended over \$500,000 in remodeling, replacing and extending their plant. A number of novelties in plate-mill practice have been introduced, to which we especially wish to call attention.

The new works, as shown on the plan, really encircle the former plant. The main equipment of the new works consists of a 34-inch three-high plate mill, G, with rolls 124 inches long. This mill is driven by a 46 x 48 automatic piston valve engine, F, with a 26-foot 40-ton fly wheel, and it is probably the first mill of the character built in this country driven by an automatic engine. The results obtained by its use have equaled the expectations of the builders, and we hope in the future to be able to illustrate more fully the details of the rolling-mill engine, which have been worked out to embrace the niceties of the theoretical requirements, together with the massiveness and weight that is essential for engines for rolling-mill practice.

The plan itself shows the works as grouped on four sides of a square. The open hearth plant A consists of two 15 and six 30 ton furnaces, all at present being served with natural gas, but the four new ones are built designed to turn at any time on to producer gas. The furnaces are all of the "Lash" type, having the regenerators in the flue leading to the stack. Four soaking-pit furnaces, E, are provided for the plate and universal mill, each with three holes. The holes are of unusual size, being 4 x 6 feet 6 inches. In two of the furnaces the holes are 7 feet deep and two of them 5 feet 6 inches deep. In addition to these furnaces there are four large heating furnaces, a, used exclusively for blooms and slabs. The covers of the soaking-pit furnaces are removed by hydraulic cylinders, and disk valves 30 inches in diameter are used entirely for reversing, there being four chimney, two gas and two air valves. The valves are operated by small hydraulic cylinders.

The introduction of pit furnaces for this class of work is a decided novelty, they being the first ones used in this country for general plate-mill work. Small ingots are charged on the side piled one on top of the other with brick placed between.

Spanning the furnaces are two electric traveling cranes, three each of 10 tons capacity, 47 feet 3 inches span. The speeds of these cranes are somewhat unusual, having a bridge speed of 300 linear feet per minute, trolley speed of 150 feet and hoist 100 feet, the aim being to have the ingot moved with the same rapidity as it is done by a hydraulic crane. In addition to the three usual movements of the crane, the tongs are released by a small 1½ horse-power motor. One of the peculiarities of the cranes is that one lever controls both the movement of the trolley and the movement of the bridge, the manipulating lever moving on a ball and socket joint, the operator simply directing or pointing the lever in

the direction that it is desired to carry the load.

Covering the plate-mill train proper is a 25-ton electric traveling crane, 2, of 37 feet 3 inches span, which is used for changing rolls and repair work generally; this same crane spans a large roll lathe, Z.

In the shear building or shipping department two more cranes are placed, each of 5 tons capacity and 68 feet 3 inches span, which are used for loading purposes, not only for the plate mill proper, but for the universal and sheet mills C. These cranes were all built by the Shaw Electric Crane Company of Muskegon, Mich.

Among other novelties noticeable on the plate mill is the fact that the screws are driven by an electric motor. An ordinary 25 horse-power Westinghouse electric street car motor is attached to the worm shaft, the lever being worked by the screwman at this point. The final gauges are made with the hand wheel the same as usual. One advantage of the motor is that it does not in any way interfere with the use of the hand wheel.

The cooling tables are 375 feet long from the center of the mill to the blade of the shear, the rollers being 13 inches in diameter, 6 feet long and spaced 2 feet 7 inches between centers. At the point K mechanism is introduced to turn the plate into a vertical position so as to permit the under side to be inspected.

The entire plant is driven by 24 two flue boilers, each 54 inches diameter by 30 feet long, with two 18-inch flues, and the electric department is driven by two horse-power dynamos, W, driven by a 150 horse-power Ball engine, X.

The main shear L is one of the Morgan Engineering Company's heaviest build, having 136-inch blade, capable of cutting 2½ inches. A duplicate of the shear is now being erected, which weighs 185 tons. Two auxiliary shears, N, are provided, one for templet work and one for scrap, each shear being driven by its own engine. The usual casters are provided on the shearing floor and an Aiken hydraulic scale is located at point N.

In the open-hearth department it was a matter of necessity that the general arrangement, which was fixed by the four old furnaces, be carried out in the addition to the four new ones, and outside of the method of working the valves, which is done entirely by hydraulic power, and in the arrangement of the ladle crane, no special novelties are introduced.

The plate mill proper has three-high rolls 34 x 124, middle roll 20 x 124, with lifting tables on both sides having a capacity of 10 tons each. The pinions are of steel, and each roll housing weighs 26 tons. The pressure system is supplied with five Epping, Carpenter & Co.'s pumps, R, 24 x 8 x 24. The two boiler feed pumps Q, 8 x 5 x 12 duplex, are controlled by a pressure accumulator.

The dimensions of the various buildings are as follows; Open hearth, 384 x 116 feet; heating furnace, 222 x 64 feet; building over plate mill, 118 x 40 feet; building over boilers and cooling table, 325 x 78 feet; shear building, 300 x 71 feet; universal mill building, 318 x 80 feet; sheet mill building, 200 x 60 feet.

The plate mill and engine driving the same, together with some of the minor machinery, were all built by Mackintosh, Hemphill & Co., Limited, while the boilers and buildings and wrought-iron structural work was all made by Riter & Conley from the general plans of the Pittsburgh Iron & Steel Engineering Company. The latter firm built the entire works under contract, the same having been made on January 20, 1892, the first plate being rolled on November 10, 1892.

With eight large open-hearth furnaces, one 36 inch universal mill, one 48-inch sheet mill and one new three-high 124-

inch plate mill, this company rank as one of the heaviest producers of steel plates in this country. They have just completed several large orders for the new vessels of our navy, and are at present engaged in rolling nickel steel protective deck plate for cruiser No. 13, which is being built by the Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa.

They have just been awarded the contract for all the steel work on the new battle ship "Iowa" and the armored cruiser "Brooklyn." This makes five in all for which they have or will have furnished the material, the last five let by the Government. In addition to this the Cramps have given them the contract for the boiler steel for three of the four large vessels to be built for the National Steamship Line and to correspond to the "New York" and "Paris."

The Laidlaw-Dunn-Gordon Company.

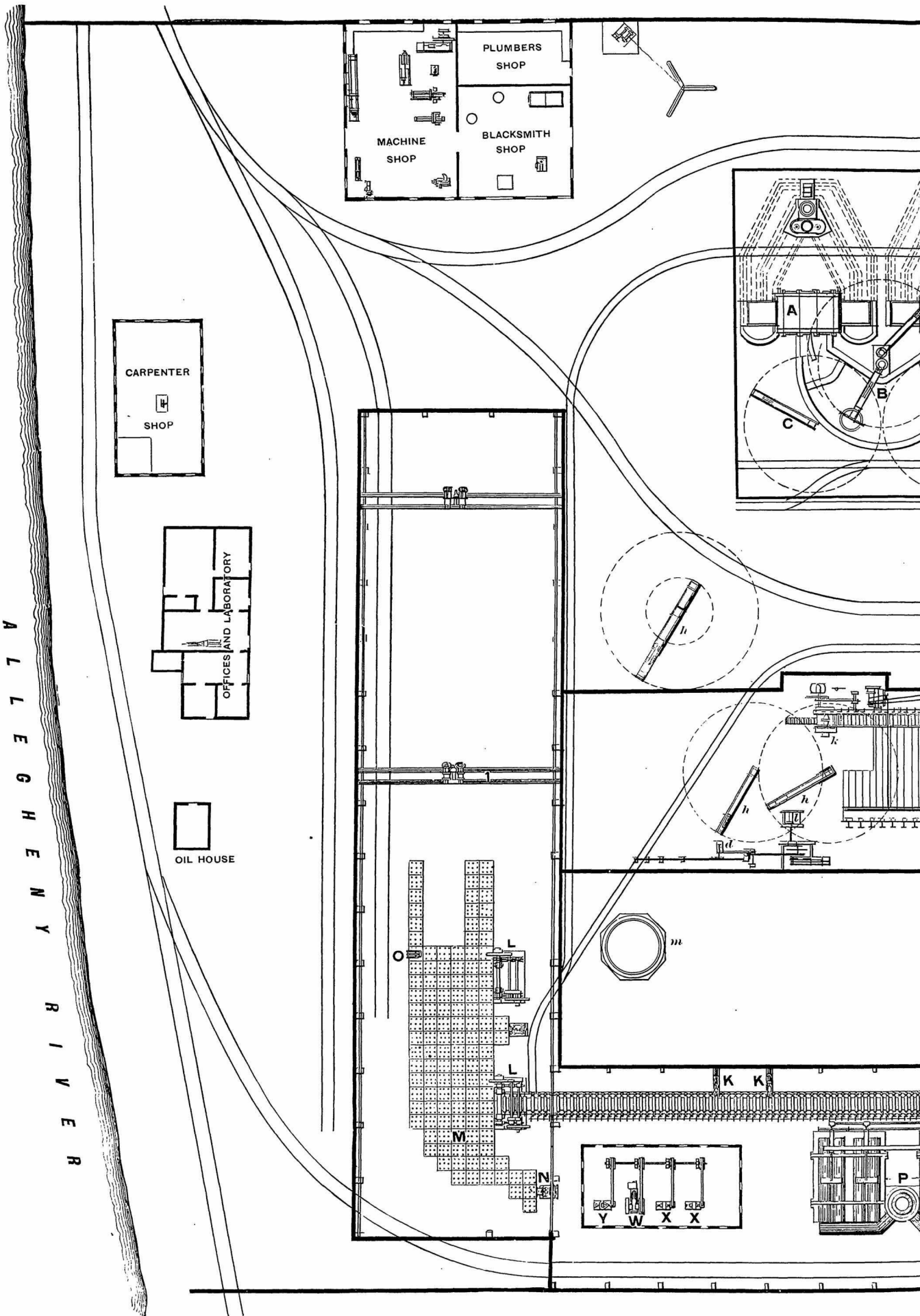
The Laidlaw & Dunn Company of Cincinnati, Ohio, and the Gordon Pump Company of Hamilton have agreed on terms of consolidation. The business of the two companies will be carried on by one company, to be called the Laidlaw-Dunn-Gordon Company. Its capital stock will be \$700,000. The consolidated company will at a very early date begin the erection in Cincinnati or its immediate vicinity of a large pump and hydraulic works.

As soon as the new factory is erected, the Gordon Pump Works will be moved from Hamilton to the new works, and the manufacturing department of the Laidlaw & Dunn Company will also be transferred to the new works. The present office and manufacturing premises of the Laidlaw & Dunn Company, on the southeast corner of Pearl and Plum, and the northeast corner of Second and Plum, will be the permanent principal offices and supply department of the company.

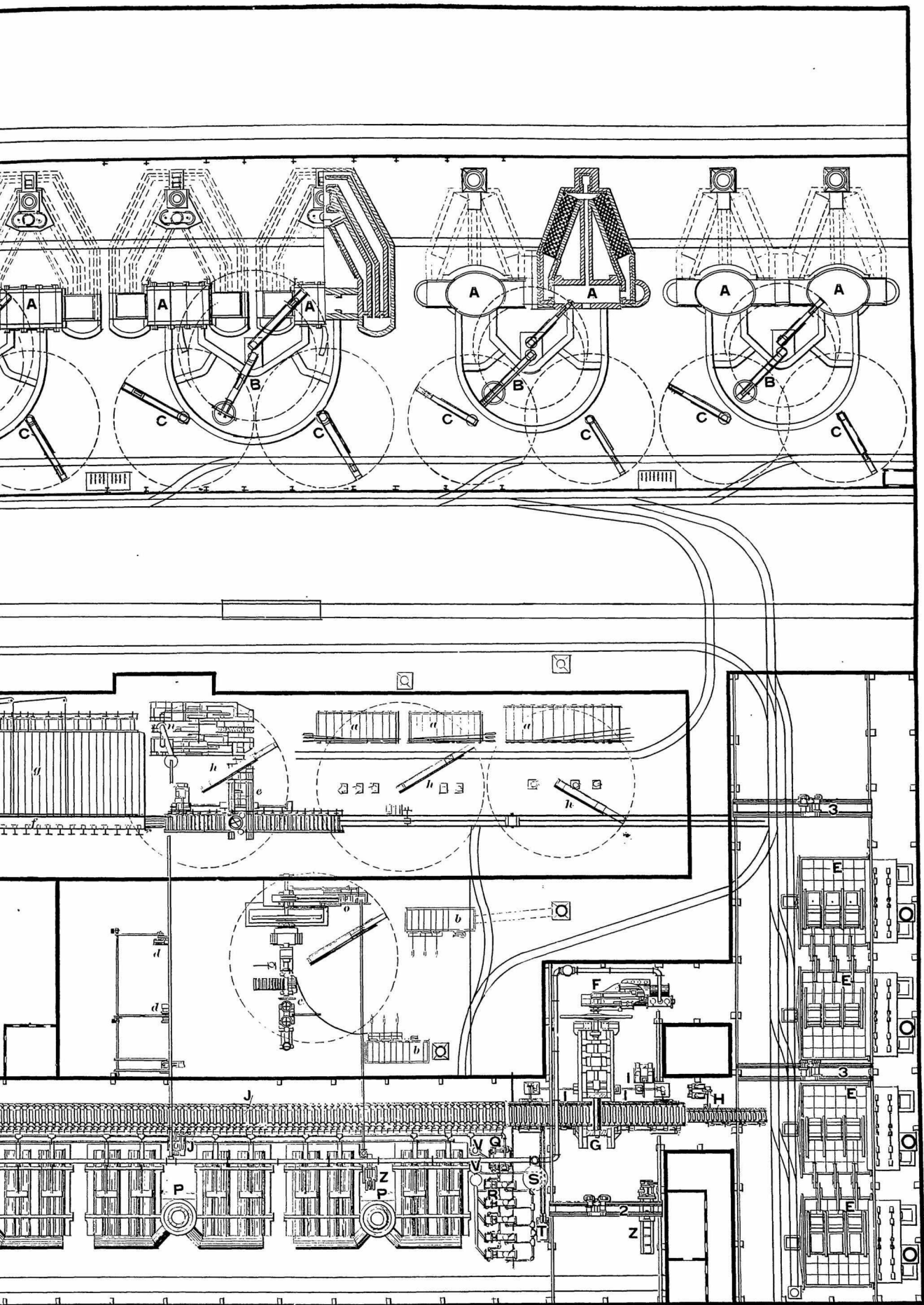
The company will operate their own brass and iron foundry when in the new plant and will give employment to something like 350 men. The present plant in Cincinnati will also be retained, while that at Hamilton will be dispensed with. The site for the new plant has not yet been selected, but will be within the next few days, after which plans will be drawn and the erection of works will be immediately commenced.

The directors of the new company will be Robert Laidlaw, Walter Laidlaw, John W. Dunn, Thos. McDougall, Alexander Gordon, Robert McKinney, Thos. T. Gaff. The officers of the company will be Robert Laidlaw, president; Walter Laidlaw, vice-president and general manager, and John W. Dunn, secretary and treasurer. The stock of the company will be taken and held solely by the parties now interested in the two companies. There will be none of it on the market for sale.

United States Senator Frye, chairman of the Committee on Commerce, spoke for two hours last week in Philadelphia on "The American Merchant Marine," and had among his auditors the principal shipbuilders in the city, besides many ship-owners and engineers. The address was an argument for government subsidies. "As early as 1835 England paid \$2,000,000 in subsidies, and when the Cunard line was established in 1839 it received in subsidies \$425,000, which were increased to \$850,000 in 1852, when the Collins line was started under the American flag, and finally reached \$7,000,000 a year, she even guaranteeing her steamships 8 per cent. dividend. The result is," said Senator Frye, "that last year Great Britain built 87 per cent. of the ships of the world, and owned one-half of the documented vessels."



- A—Open-Hearth Furnace.
B—Casting Cranes.
C—Ingot Cranes.
D—Hydraulic Valves to Cranes.
E—Three Pit Furnaces.
F—46 in. x 48 in. Mill Engine.
G—34 in. x 124 in. Three High Plate Mill.
H—6 in. x 8 in. Engine and Approach Table.
I—10 in. x 12 in. Engine and Tilting Tables.
J—10 in. x 12 in. Engine and Cooling Table.
K—Plate Flopper.
L—132 in. Plate Shear.
M—Caster Plates.
N—Trim Shears.
O—Scale.
P—52 in. x 30 ft. Two-Flue Boilers.
Q—8 in. x 5 in. x 12 in. Duplex Boiler Feed Pumps.
R—24 in. x 8 in. x 24 in. High-Pressure Pumps.



S—Hydraulic Accumulator.
 T—Return Tank.
 U—Feed-Water Accumulator.
 V—Feed-Water Heater.
 W—15 in. x 14 in. Ball Automatic Engine.
 X—Electric Power Generators.
 Y—Arc Light Dynamo.
 Z—Roll Lathe.
 Z'—Fire Pump.

a—Furnace.
 b—Furnace.
 c—Sheet Mill.
 d—Shear.
 e—Universal Mill.
 f—Straightening Bed.
 g—Cooling Table.
 h—Crane.
 k—Shear.

l—Winding Drum.
 m—Tank.
 n—Universal Mill Engine.
 o—Sheet Mill Engine.
 1—Electric Crane.
 2—
 3—

ON STEEL COMPANY.

THE WEEK.

The Hudson River steamer "Albany," 295 feet in length, is being cut in two in a shipyard on the Delaware and 30 feet additional inserted amidships.

The proposed gigantic sole-leather trust, representing \$75,000,000 capital, is believed to be nearing completion, as the leading Eastern tanneries have all been examined and appraised.

The Pacific Short Line bridge, to cost \$1,000,000, will soon be completed. The aim is to get a connection with the Black Hills.

The ships of Admiral Gherardi's squadron, in returning from the Pacific, were retarded 2 knots an hour compared with the start, by the accumulation of barnacles on their bottom. Believers in sheathing know of only one remedy for this difficulty. The cost of fuel to bring these ships around from San Francisco is said to have been \$200,000.

Manager Hughes of the Ward Line of steamships is not in the least discomfited by the financial difficulties of the Brazil Mail Steamship Company. He does not find in the fact any evidence that American steamship lines cannot succeed.

Baron Hirsch's Hebrew colonies in Argentine are suffering from the antipathies of the Spanish and Portuguese population and the climatic conditions are the subject of complaint.

Referring to the growth of the coastwise coal trade during the last ten years, Eugene P. Carver, long connected with shipping interests in Boston, says that a careful computation of all the elements which enter into the question of water transportation leads him to believe that there is more income to be derived from the investment from schooners of from 500 to 1000 tons register than from any other class of vessels used in the coastwise trade.

An official decree in Mexico reduces the tariff on horses, hogs, cloths, tobacco, soap, liquors, drugs, seeds, cotton, lace and fiber.

The Canadian House of Commons, at Ottawa, rejected an amendment to the budget declaring for the immediate revision and lowering of the tariff.

Mica in large quantities is being mined in Goochlin County, Va.

The Legislature of Indiana in 1891 passed a law which increased the taxable valuation of railroad property in that State from \$69,000,000 to \$169,000,000. The railroad companies fought the law through all the courts, and a decision was rendered a short time since by the Supreme Court affirming the validity of the act. As a result the State will get a revenue from the railroads amounting in round numbers to \$1,500,000 a year.

It is said that the numerous canning factories being erected throughout West Tennessee will, to a great extent, reduce cotton production and build up truck farming and the fruit industry.

Several foreign capitalists propose to make a large purchase of land in Texas for the cultivation of cotton, which prompts a Mobile paper to remark that it is questionable whether the South should favor the cultivation of cotton by great foreign syndicates, who, with steam plows, commissary stores, picking machines and oil compress, will be able to reduce the cost of making cotton so low as to drive out of the race the individual farmer and mule.

Barbed-wire fences may be used in New York State. In the Assembly, 28th ult., a bill prohibiting the use of barbed-wire

fences was literally laughed out of the House. Ryder of Westchester attacked it in humorous poetry; Ainsworth stabbed both it and its promoter with keenest satire, and then the members generally played foot ball with it. The bill was, by a vote of 84 to 16, referred to the Committee on Public Health, with instructions to strike out the enacting clause.

Frenchmen are about to lay a submarine cable from Australia to New Caledonia.

Manitoba farmers demand that American agricultural machinery and barbed wire shall be admitted free of duty.

The American Consul at Singapore suggests that a wholesale importing and exporting firm of known reputation might do a successful business among the 1,000,000 inhabitants of the Straits Settlements. The trade with the United States amounts to \$12,000,000, and is altogether in the hands of English and German merchants.

The estimated export of wheat from Argentina in 1891 was five times as large as in 1885, and the area under wheat is believed to be nearly 3,000,000 acres, or nearly one-third of the whole area under cultivation in 1892. The crop prospects for the next season are only fairly good.

A high bridge has been built over Jack's Run, near Pittsburgh, for a coal railway company. The height of Jack's Run bridge is 155 feet, as compared with 135 in the case of the Brooklyn Bridge. It has a roadway of 17 feet and two 5 foot sidewalks on either side, making 27 feet over all. The bases of the central supporting iron towers are 60 feet square. The cost is \$65,000.

A migration of negroes from East Tennessee and other parts of the South has commenced, not unlike that noted a year ago, when many started for Liberia. This time they are going West, some to Oklahoma. The only trouble is in stopping. In several localities vigilance committees have been formed, who order the negroes to "move along."

The American Santo Domingo Improvement Company have entered upon their work of collecting the customs revenues of the Black Republic and will take prompt measures to suppress smuggling and all official crookedness.

The Marine Engineers' Association of America is endeavoring to prevent the licensing of British subjects as engineers of the newly Americanized fast steamships "New York" and "Paris."

Just now the fad in Mexico is growing coffee, for coffee raised in Mexico is proving superior in quality to that of Brazil or Java. Many Englishmen and Germans are buying coffee farms, which are now very cheap.

Cholera is spreading in Russia, and is expected to resume its advance around the world in the spring unless prevented by quarantine regulations.

A tunnel is being bored through solid rock under the East River at Seventy-first street, as supposed for the admission of gas pipes connected with Long Island City. On Saturday a foreman in charge, who had just passed through the air lock, suddenly died from the effects of atmospheric compression. The pressure was 40 pounds to the square inch.

A British syndicate has acquired possession of the Nicaragua State railways and lake steamer system.

The Hudson River Bridge bill failed to pass the Fifty-second Congress.

Steering traffic from Europe to this country has been resumed by all the large lines doing business at this port, as a result of the passage of the immigration act at Washington, but all the lines will hence-

forth charge higher rates. For their own protection the steamship companies will not carry any immigrants from Russia, as in that case they are liable to have their steamers held under the 20-day provision. Immigrants from countries in which cholera has not yet been stamped out, or immigrants who have passed through cholera-infected ports on their way to the port of embarkation, will be barred.

The Pittsburgh Builders' Exchange favors the establishment of a trade school at Marganza, but the bricklayers' union are opposed.

There are two steel vessels building in the Wheeler yard at Detroit valued together at \$1,500,000, and 1300 men are employed on them.

The Condition of the Treasury.

The money in circulation on March 1 was \$1,599,655,542, against \$1,609,558,892 on March 1, 1892, a decrease of \$9,903,350, or \$0.67 per capita. The principal changes have been an absorption by the public of gold coin to the extent of \$2,000,000, of silver dollars to the extent of over \$1,000,000, of subsidiary silver to the extent of nearly \$1,750,000, of Treasury notes to the extent of \$50,750,000, and of national bank notes to the extent of \$2,000,000. On the other hand, gold certificates in circulation have diminished over \$45,500,000, silver certificates over \$3,750,000, United States notes almost \$8,000,000 and currency certificates over \$10,000,000.

The following is a comparative statement:

	March 1, 1893.	March 1, 1892.	Changes.
Gold coin..	\$409,817,138	\$407,813,501	Inc. \$2,003,637
Standard silver dollar...	60,432,090	59,264,520	Inc. 1,167,570
Subsidiary silver....	64,021,838	62,308,717	Inc. 1,713,121
Gold certificates...	114,385,729	160,001,279	Dec. 45,615,550
Silver certificates...	321,279,132	325,141,186	Dec. 3,862,054
Treasury notes...	126,447,613	75,718,553	Inc. 50,729,060
United States notes...	814,174,742	322,131,688	Dec. 7,956,946
Currency certificates....	19,250,000	29,350,000	Dec. 10,100,000
National Bank notes...	169,844,260	167,829,448	Inc. 2,014,812
Total..	\$1,599,655,542	\$1,609,558,892	Dec. \$9,903,350

From this table we see that there is a loss of about \$62,500,000 in gold coin and bullion, which has been partly replaced by \$42,750,000 of silver coin and bullion. The decrease in holdings of subsidiary silver and Treasury notes is about offset by an increase in United States notes. The total cash in the Treasury is \$16,500,000 less than a year ago.

There are outstanding \$440,622,355 of obligations demanding repayment in gold (exclusive of gold certificates), against which the Treasury holds \$103,284,219 in free gold. This is 23.4 per cent. of the liabilities, as against 30.1 per cent. on March 1 last year and 24.38 per cent. on February 1.

Following is a comparative statement:

	March 1, 1893.	March 1, 1892.	Changes.
Gold coin \$137,837,900	\$137,837,900	\$198,847,863	Dec. \$61,009,963
Standard silver dollar...	358,474,895	352,920,220	Inc. 5,554,675
Subsidiary silver....	10,971,876	14,787,832	Dec. 3,815,956
Treasury notes...	5,420,240	9,517,659	Dec. 4,097,419
U. S. notes	32,506,274	24,549,328	Inc. 7,956,946
Nat'l bank notes....	5,578,128	4,792,427	Inc. 785,701
Total.	\$550,789,313	\$605,415,329	Dec. \$54,626,016
Gold bullion.....	\$79,835,048	\$81,194,377	Dec. \$1,359,329
Silv. bullion.....	102,973,771	65,720,466	Inc. 37,253,305
Total.	\$733,598,132	\$750,092,315	Dec. \$16,494,183

The Iron Age

New York, Thursday, March 9, 1893.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Traffic with the Pacific States.

No one not in some way identified with the California trade during the last 15 years can have an adequate conception of the exasperating circumstances under which this trade has been conducted. Throughout this period merchants have been handicapped by exorbitant freight charges. A very brief experience would suffice to show that the transcontinental railroads and the Pacific Mail Steamship Company were in league with the object of maintaining charges at a maximum rate. The latter, plying via the Isthmus of Panama, was of necessity compelled to make a transshipment at that point via the railroad. In course of time it came about that the railroad passed virtually under French control, and as the sequel proves this short piece of railroad track was about the only solid asset to be found among the fragments of De Lesseps' famous canal scheme when the final disruption occurred; the funds collected for the prosecution of this magnificent enterprise having meanwhile entirely vanished.

At the present time the merchants, who so long have borne in enforced silence the exactions imposed, derive a sort of grim satisfaction from the disclosures just made by the Panama Investigation Committee authorized by Congress, in which they find that all of the organizations above named were under a single control and to a great extent directed by the same individuals.

"It seems to be certain," so we are told in this report, "that a very large, if not an absolutely controlling, interest in the stock and directory of the Pacific Mail Company is owned by individuals and estates very largely interested in the stock and directory of the transcontinental roads, and it is proved that the same individuals composing a majority of the directory of the Pacific Mail at that time composed a majority of the Directors present at the meeting of the Panama Railroad Company's directory at which the contract of February 1, 1878, between the Pacific Mail and the railroad company was ratified and executed."

The merchants therefore were in the hands of the Philistines, helplessly bound under a compact from which there was no release. No escape was possible, for no shipper of merchandise by the overland route could enjoy that privilege and at the same time make shipments "around the Horn" at discretion. He must adhere to one or the other, under heavy penalties. The patron of the overland route who should have the temerity to send merchandise to the pier for shipment by "a clipper" was liable to be a marked man. And it was in vain to appeal for redress. Hence the effort to sustain lines of clipper ships was a continuous battle,

operating in restraint of trade and every way prejudicial to the public interests. Only by tactics like these was it possible to hold up freight charges on the Pacific trade to the satisfactory standard of remuneration. Only in this way was it possible for the Transcontinental Association to pay over to the Pacific Mail line an enormous monthly subvention. As a consequence the merchant marine has been dwarfed, the commerce of the United States crippled at a vital point and the enterprise of merchants paralyzed. There is therefore good reason for the recommendation of the Congressional committee that in the future in all ocean mail contracts the Postmaster-General insert a clause providing that whenever it is found that carriers enjoying the benefits of the contracts enter into any combination in restraint of trade and competition, the subsidy shall cease. We have here another illustration of the ancient truism, "When rogues fall out," &c. The wreck of the grand canal scheme will not be without some incidental benefit in breaking up and bringing fully to light a flagrant abuse that existed in defiance of sound principles of commercial law and was too long tolerated.

British Trade for 1892.

The aggregate of British trade during 1892 declined about 4 per cent., compared with the previous year. For foreign commerce the record is as follows:

	1892.	1891.	Inc. or Dec.
Imports.....	\$2,055,876,200	\$2,113,101,350	— \$57,225,150
Exports of British and Irish produce.....	1,101,241,000	1,199,089,750	— 97,848,750
Re-exports.....	812,840,000	299,710,600	+ 513,129,400
Totals.....	\$3,469,457,200	\$3,611,901,700	— \$142,444,500

The statistics of imports are not regarded as so unsatisfactory as mere comparison of values would indicate, as the increased amount of foreign produce imported for reshipment is not an unfavorable feature, and the falling off in imports for home consumption was wholly due to the lower prices paid for commodities. An examination of all available statistics shows that manufacturers had to contend both with a lessened demand and declining prices, but the agricultural industry suffered most severely, and there is no prospect of speedy relief. The London *Economist* says:

Like other producers, farmers must meet increased competition by greater economy of production and distribution. They have gone as far as they can go profitably in reducing the expenses of labor; but they have done nothing, or next to nothing, at present in the direction referred to above, in connection with co-operation. If prices remain as they are rents must be further reduced, and certainly will come down, and no other immediate relief to farmers who are really in distress is available.

But low prices for produce were far from being an unmitigated evil, as the great body of people have had the advantage of cheap food, which goes far to offset the decreased earnings of the working classes. The special hardship, so far as the latter are concerned, is that the lack of employment was a cause of

privation rather than reduced wages. The proportion of those who were unemployed at the end of the year, exclusive of the cotton spinners and others on strike, was 8.3 per cent., as compared to 4.4 per cent. in 1891 and a much smaller proportion in several years preceding. The lack of confidence still felt by the investing public does not augur an early return of activity in the channels of trade and industry.

THE *Economist* adds:

In some respects the outlook certainly is more favorable than it was at the beginning of 1892. The wages readjustment effected during the year has gone some way toward enabling producers to meet the fall in prices by a reduction of working expenses. The paralysis of business in Australia consequent upon the financial crisis is being slowly recovered from. In South America also more business activity is being shown.

On the other hand the condition of the working classes in the United Kingdom is not so good as it was a year ago, and trade with India and the East is likely to be disturbed by fluctuations in the silver market, but balancing all probabilities, some warrant is found for a belief that business will gradually improve. The reality of the depression now existing is in nothing more visible than in the unprecedented accumulation of unemployed shipping at all the ports.

To Evade the Sunday Law.

A decidedly unique suggestion comes from the West anent the World's Fair Sunday-opening question. As our readers

know, a very stubborn fight has been made on the Congressional enactment forbidding the local management to open the gates on Sunday. Sabbatarian regulations in Chicago, as well as in some other cities of the West, are decidedly at variance with Eastern customs. The cosmopolitan nature of their people is the cause. Therefore public sentiment approves the use of Sunday for purposes which the more orthodox East most heartily condemns on that day of the week. Residents of other sections of the country do not comprehend the situation, and have consequently been surprised at the vehemence with which the Sunday "openers" have contended for the adoption of their views in the regulation of the World's Fair. They will be still more surprised at the suggestion how to evade this law, to which reference was made in the opening sentence.

The proposition is made, and evidently in all due seriousness, that the factories in and near Chicago should be run on Sunday during the fair, and that the employees should take their day of rest on Monday. The substitution of Monday for Sunday would, it is claimed, give artisans the chance to visit the exposition weekly, for which they have been contending. The Sunday "openers" have steadily asserted that their sole object has been

to give working people the opportunity to obtain educational advantages as afforded by the exposition without the loss of time, which is a heavy tax on those who work for daily wages. The proposition to run the factories on Sunday instead of Monday would meet the objection to closing the fair on Sunday, if it were not for the religious question involved. It is true that Sunday is growing less and less a day strictly observed by devotional exercises and more and more a day for relaxation and recuperation. But we are inclined to believe that, even in our most cosmopolitan cities, the time has not yet arrived for such a radical departure from time-honored custom as the substitution of Monday for Sunday would involve. Employers are more conservative than their workmen. A striking lesson can, however, be drawn from this rather startling suggestion, which is that a community is very apt to find a practicable way of defeating a law, if it is not upheld by a strong public sentiment.

The White Lead Situation.

The excitement that has prevailed on the Stock Exchange of late, and the sensational developments in connection with operations in various railroad and so-called industrial properties, has, it would appear, led to somewhat severe attacks upon the status of various corporations—the industrials in particular. Newspapers that are on record as being opposed to everything in the nature of combination or concentration of manufacturing interests have presented, in more or less sensational style, the weakest spots in the several organizations, and, it is to be regretted, have also printed as facts some wild and misleading statements emanating from speculators who stop at nothing that may serve their purposes. Among other properties against which the arrows of the speculator and the distinctly "anti-combination" press have been viciously directed the National Lead Company are prominent. It is doubtful if as many misleading statements have been publicly circulated regarding any other company or corporation during the past month or six weeks.

Some writers have presented statistics calculated to make it appear that the aggregate capacity of corrodors, independent of the National Company, is quite as large as that of the latter concern. The output of the National is placed by those writers at 70,000 tons per annum, and the independent production at the same amount. This is not in harmony with the facts. The National Company have a capacity of 80,000 tons. It cannot be demonstrated that the "outside" production of pure white lead, including that manufactured by the "quick process," is over 20,000 tons per annum. The combined total of outside production of pure lead, mixtures of lead and zinc, lead, zinc and barytes and lead and barytes, will not, according to competent authorities, reach the 70,000 tons that has been given as an estimate of the outside production of white lead. That estimate is, in fact, extremely hazardous, since there are no statistics in existence upon which any reliable calculation can be made. Doubtless some of the

better varieties of lead and zinc mixtures and quick process white lead answer as well as the pure carbonate produced under the old Dutch process for various purposes, but they are not formidable competitors in the full meaning of the term. Proof of this exists in official data showing that, while the manufacture of the cheaper goods may have increased considerably, the production and sale of pure carbonate has more than held its own in the expansion of outlet for nearly all varieties of paints during the past decade.

Another misstatement for which speculators are responsible is one to the effect that the plant of the corrodors can be duplicated for \$2,000,000. How fallacious this statement is needs no further proof than the annual report of the National Company. That report shows that the net cost of stock on hand—manufactured, in process and raw—was no less than \$4,468,170 on December 31, 1892. It is no secret that the value of real estate, machinery and patents alone far exceeds \$2,000,000.

Besides the misleading statements regarding output, there are others bearing upon the variety of corrodors' product and the prices for the same that deserve more than passing notice. For example, an improper insinuation is thrown out to the effect that several grades of white lead are turned out from a single factory of the National Company. This insinuation is, doubtless, prompted by the fact that the concern control all the labels of the old individual concerns and simply oblige customers who may call for any particular brand that they may favor. The lead is, in all cases, the same in quality and in price.

The above outline of facts and the correction of various misstatements may, in the eyes of some readers, have the appearance of being in the interest of one company, but our intention is to merely state the truth, and, in fairly doing so, find it is impossible to avoid what has the appearance of being a leaning to one side. The enterprise and progress of independent corrodors, manufacturers of mixed leads and ready-mixed paints is commendable and deserving of the best possible returns financially. Still, erroneous statements regarding such an important industry as the manufacture of pure white lead, conceived as they are in speculative quarters and spread broadcast solely in the interest of Wall Street stock operators, should be taken with a great deal of allowance, and proper credit be given where credit is due.

The Chicago Smoke Nuisance.

The best evidence thus far elicited that the Chicago crusade against bituminous coal smoke is proving effective is seen in the recent organization of a society to protect the smoke makers. Quite a respectable number of manufacturers have agreed to support one another in fighting the efforts of the Society for the Prevention of Smoke. They are supported by some of the bituminous coal merchants, who believe that their commodity is suffering unjust treatment at the hands of the society's agents. An address which has been issued by the

"smoke makers," and which states that they have been unable to find economical and efficient devices for the complete combustion of bituminous coal, has called forth quite unexpectedly a most gratifying expression of opinion from other manufacturers, who state that they are using apparatus for the prevention of smoke which they have found both satisfactory and economical. The Society for the Prevention of Smoke, instead of being overwhelmed by adverse sentiment crystallized through a formidable organization, have had their methods vindicated by a chorus of enthusiastic steam-raising supporters in the Chicago daily press. It is quite safe to say that nothing could have happened to give their efforts to suppress the smoke nuisance a greater impetus than this abortive opposition. The fight against smoke makers has been long and bitter, with the result often doubtful, but now the prospects appear to indicate that victory is at last dawning for the smoke preventers.

PERSONAL.

On Friday, March 3, Col. J. Morgan Coleman, a well known iron manufacturer of the Mahoning Valley and of the firm of The Coleman, Shields Company, at Niles, Ohio, was stricken with apoplexy in his rooms at the Tod House, Youngstown, Ohio, and his recovery is considered very doubtful. Mr. Coleman is well advanced in years and his health has been failing for some time past.

H. S. Evans, for several years connected with the Brier Hill Iron & Coal Company of Youngstown, Ohio, has resigned his position, to take effect on April 1. On the above date Mr. Evans will assume the duties of secretary of the Mahoning & Shenango Valley Iron Manufacturers' Association.

On the 1st inst. Irving T. Hartz resigned the secretaryship of the Calumet Iron & Steel Company of Chicago, and was succeeded by F. S. Wheeler.

Timothy J. Sullivan of Albany, N. Y., of the iron-working and boiler manufacturing firm of Sullivan & Ehlers, has been elected to the Albany Board of Aldermen.

Jos. S. Elverson, formerly superintendent of the water department and ore agent of the Crane Iron Company, Cata-sauqua, Pa., has resigned his position and accepted a position with the Catasauqua Mfg. Company, as assistant to the chairman.

Jay C. Morse, president of the Illinois Steel Company, is in California.

Reuben Patterson has resigned his position with the Pulaski Iron Company to accept that of general manager for the Roanoke Furnaces, Roanoke, Va. He will take charge on March 13.

Col. Richard Vose, for over 40 years prominently identified with the car-spring business and the inventor of several car-spring appliances, died at Nyack, N. Y., his home, on the 25th ult. He was born at Whitesborough, Oneida County, N. Y., in 1830, and his entire life was spent in that State. In 1868 he established the firm of Vose, Dinsmore & Co., which was merged in 1875 with the Valentine Car Spring Company of which he was president. Colonel Vose was prominent in the National Guard, and commanded the 71st Regiment New York State Volunteers in the Civil War.

CORRESPONDENCE.

A Proposed Form of Combination.

To the Editor: In this day of trusts and combinations (which are being devised for the purpose of trying to keep prices up to the point of moderate profit), in the face of the fiercest competition the world has ever seen the writer thought it might be of interest to you to consider the underlying principles of the only natural combination.

The inherent weakness of all trusts and combinations heretofore entered into by the different manufacturers is the one fatal error of controlling prices by agreement. This not only creates jealousy on the part of the trade, but soon has a like effect on the members themselves; and soon all come to think that some one or more of the members of the association are getting trade that does not belong to them, and probably by cutting the association prices. It goes without saying that this state of things cannot last long, and when the break comes the prices are apt to go lower than they would have been had no association existed.

The plans which the writer has in view, which seem to combine the best and leave out the objectionable features, upon which all former combinations have sooner or later been wrecked, are few in number and very simple. He would propose, for instance, forming an association of all the bolt makers in the United States who make turned head bolts (not one left out), and appoint three commissioners, to whom salaries and necessary traveling expenses are to be paid. Their duty shall be to divide the territory in which the different bolt factories are situated equally among themselves; each of the three is to visit all the factories in his respective territories at least twice a month, with full power to go through the plant and order books of the firm, for the sole purpose of finding out whether or not too many goods were being produced.

On such ascertainment the three commissioners shall meet on some day of each month and issue orders to each and every factory, naming the number of hours to be worked by their hands during the next month; each firm being left free to send out as many traveling salesmen as they please, and to sell at such prices as they choose to, without regard to what others sell at. In a word, the sole object being to control the output, and not the price.

It is thought, that in the worst state of the market, when the prices are lowest, there is probably an overproduction of not more than 15 per cent. If this small overproduction were held down by commissioners who had power to act, prices would soon come up to a fair profit on goods, as no maker would long work for nothing, when he had on hand plenty of orders for the hours he could work during that month. Thus the plan is to allow all to sell at whatever price they please, but to completely control the output. This would not cause jealousy on the part of the manufacturer, and most certainly no outside concerns would be likely to start up when the old ones could not run full time. It would work well in toning up the market, as those who felt strong would naturally hold prices firm, and those who did not feel so strong could make any price they pleased, but the fact would remain that all could get a fair profit on their goods, as all the goods produced would be required.

Should the demand become greater than the supply on full time, then a general meeting could be called and a vote taken, allowing all to increase 10 or 15 per cent. by adding to their plant. This would always be safe, for should the market at any time show dullness the commissioners would at once cut down the number of

hours. It is thought with such an arrangement all would come in and stay in, and that the usual friction, as shown in all former combinations, would be avoided.

BOLT MAKER.

The Hamilton Patent.

To the Editor: Referring to the controversy now going on under your "Correspondence" column relative to the Hamilton patent, would it not be much more pertinent if Mr. Hamilton and his attorney, F. Jacobs, would bring a *bona fide* suit against one of the numerous users of his alleged patent, and by so doing settle the question as to the validity of the claims they make in theirs of the 13th, namely:

"We claim that cutting our boxes in two and placing them in the pinion housing in the same manner as though they had not been cut, does not evade our patent or the claims under it."

Whether cutting a solid box in two is infringing a patent on the former is not pertinent now, for we never knew a journal box for pinions so made. The obnoxious acts of Messrs. Hamilton and Jacobs are in their demanding royalty from parties using the old standard form of box, in two pieces, neither a full half box, that has been in use from time immemorial. It would appear probable that Messrs. Hamilton and Jacobs have made up a list of rolling mills from Mr. Swank's directory, and have addressed all, on the drag-net principle. For instance, royalty was demanded of the Latrobe Steel Works, who have no rolling mill about their works and have nothing like a roll pinion about them; yet if the Latrobe Works paid any attention to this demand on them, they probably received a letter that "we have had an informant in your mill, who tells us you are infringing our patent."

It is high time that rolling-mill owners treat them with contempt and make no answer but defiance. If there is a rolling mill in the country who has not received a Falstaffian threat from Youngstown, which is it? Respectfully,

JNO. F. WILCOX,

WM. WADE.

PITTSBURGH, PA., March 4.

Iron for Common Roads.

To the Editor: I have been agitating the question of the adoption of iron, or steel, for "wheel ways," for more than three years past. And I have written to a number of rolling mills in this and adjoining States, but have not found one that could furnish a bar of suitable shape for my purpose. Yet it is a very simple affair, being a 5 inch x $\frac{3}{4}$ inch bar with a $\frac{1}{2}$ -inch flange turned up on one edge so as to prevent the wheels from sliding off.

The notion heretofore universally entertained, that a tramway, or wheelway, of steel bars, must of necessity be held in place by cross ties, has been considered an insuperable obstacle to their use, their short life and great cost ruling them out. In my plan, in place of cross ties a cheap anchor will be used, by which the rails are firmly and securely held to the road bed, but in such a manner that any one bar can be easily raised or removed without disturbing other bars on the roadbed. This part is now on trial and promises to be a complete success.

If bars can be obtained at the prevailing rate for railroad rails, such a road (single track) can be built for less than two-thirds the cost of Telford or McAdam roads in this vicinity. Indeed, the county auditor's books show that the repairs on each of the four stone roads leading out of the city have in the first five years of their use cost enough to steel track them.

Yours truly, J. R. FRARY.

TOLEDO, OHIO, March 3, 1893.

Workmen's Insurance in Germany.

The action which Germany has taken in execution of the Imperial message of the year 1881 extends essentially over three different kinds of laws regulating the liability of employers to workmen—namely, insurance against sickness, against accidents and against old age and infirmity.

The laws regulating all cases of sickness were the first. They are in force since 1883. The insurance against accidents sprang up in 1884, and has extended since that time over all industrial workmen. The employers are grouped into 64 corporations, which comprise the various kinds of industrial activity. The third law, mentioned above, is dated June 22, 1889.

The following table is compiled for the Chicago Exhibition. The figures show in a very clear manner the progress and the costs of the present liability of the employers in Germany:

Table Showing a General Review on the Laborers' Insurance in 1892, in the German Empire.

Population..... 50,000,000
Number of workmen..... 12,500,000

Insurance against	Sickness.	Accidents.	Old age and infirmity.
Number of workmen assured	7,723,000	18,000,000	11,200,000
Indemnified persons.....	2,752,000	210,000	187,800
Receipts.....	\$32,010,000	\$16,490,000	\$26,238,500
a. from employers.....	7,517,500	13,095,000	11,460,550
b. from workmen.....	17,823,750	11,484,800
Expenses.....	30,070,000	13,095,000	26,238,500
a. for indemnities.....	23,037,500	7,881,250	5,432,000
b. for administration.....	1,503,500	1,794,500	1,086,400
Reserve funds.....	26,675,000	24,492,500	39,488,700
Average indemnity.....	8.50	44.40	29.10
Average costs per workingman.....	2.10	.75	2.25

The three branches of workmen's insurance in Germany have created a Labor law, the purpose of which is to assist these who are in want of help in the inevitable cases of distress in our modern industrial life. Since the few years of enforcement of the laws the costs amounted to nearly \$240,000,000, of which nearly one-half were paid by the employers and the other half by the workmen.

W. & A. Fletcher Company Mutual Benefit Association.

The employees of the W. & A. Fletcher Company, engine builders and boiler makers, of this city, organized themselves into a mutual benefit association February 4, 1893. The object of the organization is to furnish relief to members in case of sickness or disability, and in the event of death a stated sum (\$50) to those entitled to receive it. There are four officers—president, vice-president, treasurer and secretary—and three standing committees of three members each, viz., Relief, Examining and Auditing committees. The initiation fee has been placed at 50 cents and weekly dues of 25 cents. The weekly benefits, under proper restrictions, are limited to \$5 per week for not more than 12 weeks during the year. The life of the association is one year, to be renewed annually if so desired.

The Diamond Exchange Building, 11 stories high, fitted throughout with glass partitions, will be erected at 14 Maiden Lane, at a cost of \$275,000.

Increased Pig Production.

The increase in the rate of the production of pig iron during February was due both to the coke and the anthracite furnaces, while the make of charcoal iron has further fallen off.

On March 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity :

Fuel.	Furnaces.	Tons per Week.
Anthracite.....	74	34,773
Coke.....	145	133,579
Charcoal.....	36	8,623
Total March 1.....	255	176,978
February 1.....	251	171,201
Changes.....	+ 4	+ 5,777

The weekly product of all the furnaces on February 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
March 1, 1893.....	255	176,978
February 1.....	251	171,201
January 1.....	246	173,068
December 1, 1892.....	246	176,271
November 1.....	244	171,082
October 1.....	236	158,027
September 1.....	236	151,648
August 1.....	236	155,136
July 1.....	254	169,151
June 1.....	269	173,674
May 1.....	268	177,886
April 1.....	290	185,462
March 1.....	305	193,902
February 1.....	308	187,383
January 1.....	305	188,082
December 1, 1891.....	304	188,135
November 1.....	306	187,085
October 1.....	299	181,615
September 1.....	296	170,840
August 1.....	293	169,576
July 1.....	293	171,115
June 1.....	253	146,732
May 1.....	227	115,590
April 1.....	228	113,483
March 1.....	257	184,528
February 1.....	294	146,050
January 1, 1891.....	302	167,599
December 1, 1890.....	340	183,846
November 1.....	342	177,958
October 1.....	336	179,263
September 1.....	323	171,776
August 1.....	324	164,798
July 1.....	336	175,727
June 1.....	345	180,791
May 1.....	344	180,099
April 1.....	344	178,474
March 1.....	343	180,991
February 1.....	334	173,651
January 1.....	333	174,038

The status of the anthracite furnaces was as follows:

Anthracite Furnaces, March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	19	4	2,923	15	5,550
New Jersey.....	12	3	1,512	9	2,840
Spiegel.....	3	3	228	0	0
Pennsylvania:					
Lehigh Valley.....	46	25	10,038	21	7,900
Spiegel.....	1	1	70	0	0
Schuylkill Valley.....	30	13	6,182	17	7,020
U. S. Susquehanna Valley.....	16	8	3,209	8	1,805
L. S. Susquehanna Valley.....	17	8	4,869	9	2,089
Lebanon Valley.....	15	9	5,742	6	2,010
Totals.....	159	74	34,773	85	28,714

For a number of months past our records of active anthracite furnaces show the following:

	Furnaces in blast.	Capacity per week.
March 1, 1893.....	74	34,773
February 1.....	74	32,871
January 1.....	70	32,772
December 1, 1892.....	69	33,602
November 1.....	69	30,869
October 1.....	69	29,958
September 1.....	66	27,453
August 1.....	66	28,821
July 1.....	72	31,754
June 1.....	76	33,209
May 1.....	81	35,473
April 1.....	84	36,487
March 1.....	89	38,678
February 1.....	92	38,124
January 1.....	94	38,307
December 1, 1891.....	85	34,905
November 1.....	87	33,802

October 1.....	85	32,459
September 1.....	82	31,214
August 1.....	88	32,860
July 1.....	92	37,892
June 1.....	91	36,561
May 1.....	90	35,331
April 1.....	91	36,598
March 1.....	93	38,543
February 1.....	95	40,212
January 1.....	101	43,166

There were very few changes in the working anthracite furnaces. One Crane went out while Robeson started in February, which, in spite of its being a short month, showed quite a heavy product.

The following coke furnace capacity was active on the 1st inst.:

Coke Furnaces, March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	7	4	3,951	3	1,300
Pennsylvania:					
Pittsburgh district.....	24	21	34,539	3	4,536
Spiegel.....	1	1	525	0	0
Shenango Valley.....	18	9	8,697	9	6,510
Junata and Conemaugh Valley.....	18	9	6,768	9	3,710
Youghiogheny Valley.....	3	0	0	3	2,215
Miscellaneous.....	4	0	0	4	1,748
Maryland.....	5	2	2,950	3	3,190
West Virginia.....	1	0	0	1	250
Wheeling District.....	9	8	8,525	1	1,400
Ohio:					
Mahoning Valley.....	15	9	9,454	6	3,690
Central & Northern.....	11	8	6,798	3	2,220
Hocking Valley.....	12	2	888	10	2,850
Hanging Rock.....	15	8	1,280	7	1,926
Indiana.....	2	1	250	1	200
Illinois.....	19	9	14,024	10	15,270
Wisconsin.....	4	4	3,380	0	0
Minnesota.....	1	1	1,100	0	0
Missouri.....	6	1	510	5	2,740
Colorado.....	3	2	1,389	1	500
The South:					
Virginia.....	20	12	3,389	8	4,180
Kentucky.....	6	4	2,256	2	1,100
Alabama.....	37	23	16,910	14	8,220
Tennessee.....	13	6	3,848	7	3,030
Georgia.....	2	0	0	2	1,045
North Carolina.....	2	1	98	1	500
Totals.....	259	145	133,579	114	72,730

As compared with previous months, the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
March 1, 1893.....	145	133,579
February 1.....	140	129,396
January 1.....	138	131,731
December 1, 1892.....	136	133,100
November 1.....	133	130,873
October 1.....	128	118,995
September 1.....	128	114,538
August 1.....	131	117,984
July 1.....	140	127,433
June 1.....	145	128,652
May 1.....	147	132,318
April 1.....	152	138,116
March 1.....	163	143,490
February 1.....	167	138,268
January 1.....	163	138,611
December 1, 1891.....	162	142,747
November 1.....	162	142,152
October 1.....	163	135,997
September 1.....	161	127,664
August 1.....	154	125,736
July 1.....	150	122,422
June 1.....	124	100,165
May 1.....	98	70,529
April 1.....	98	67,570
March 1.....	113	85,093
February 1.....	125	94,473
January 1.....	143	112,153

The new Buffalo furnace was blown in with adequate ceremonies during this month, and as a splendidly modern plant will add considerably to New York's production.

In the Pittsburgh district the same number of furnaces are running, although there have been some changes in individual stacks. Edgar Thomson Spiegel resumed only late in the month. The Shenango Valley has Alice going, while at Johnstown one of the Cambria plant blew out and Valentine stopped work. The Wheeling district is running very full, Steubenville having started on the 21st ult. The other Northern States record few important changes. In the South Citico has again been producing, and one of the new Watts furnaces is running.

The capacity of the charcoal furnaces producing was as follows:

Charcoal Furnaces, March 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	13	3	250	10	710
New York.....	5	0	0	5	583
Pennsylvania.....	13	3	175	10	760
Maryland.....	7	0	0	7	694
Virginia.....	13	1	100	12	727
Ohio.....	9	3	242	6	745
Kentucky.....	3	0	0	3	350
Tennessee.....	7	4	960	3	350
Georgia.....	3	1	245	2	320
Alabama.....	13	6	1,588	7	1,510
Michigan.....	20	9	3,184	11	2,830
Missouri.....	4	3	345	1	328
Wisconsin.....	4	1	1,339	3	200
Texas.....	4	2	285	2	410
Washington.....	1	1	0	1	170
Oregon.....	1	0	0	1	225
Totals.....	118	36	8,623	82	10,912

As compared with previous months, the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
March 1, 1893.....	36	8,623
February 1.....	37	8,984
January 1.....	36	8,865
December 1, 1892.....	41	9,509
November 1.....	42	9,540
October 1.....	39	9,174
September 1.....	42	9,667
August 1.....	41	8,381
July 1.....	42	9,964
June 1.....	48	11,013
May 1.....	49	10,100
April 1.....	44	10,859
March 1.....	50	11,734
February 1.....	49	11,061
January 1.....	48	11,164
December 1, 1891.....	52	11,033
November 1.....	55	11,731
October 1.....	58	13,159
September 1.....	56	11,968
August 1.....	54	10,980
July 1.....	50	10,801
June 1.....	44	10,056
May 1.....	39	9,730
April 1.....	41	9,295
March 1.....	51	10,890
February 1.....	56	11,365
January 1.....	59	12,290

There were blown out during February, Landon, in Connecticut; Hecla, in Pennsylvania, and Stickney, in Maryland. Boiling Springs, in Pennsylvania, has blown in on cold-blast charcoal iron, using Cuban ores as a basis. Chatham, in New York, which started on the 6th ult., was forced to bank on the 23d for lack of charcoal. Copake was starting early in the month. In Ohio Mount Vernon is again in blast.

Stocks.

The position of stocks, sold and unsold, as reported to us March 1, was as follows, the same furnaces being represented as in former months:

Stocks:	Dec. 1.	Jan. 1.	Feb. 1.	Mar. 1.
	Tons.	Tons.	Tons.	Tons.
Anthracite pig.....	138,863	135,851	140,214	141,070
Coke pig.....	411,686	422,481	414,817	392,071
Charcoal pig.....	189,616	191,574	188,094	202,283
Totals.....	740,165	749,906	743,125	735,424

The reduction which has taken place in coke stocks occurred chiefly in the South, while the increase in charcoal stocks can be traced mainly to Michigan.

The Birmingham Rolling Mill Company of Birmingham, Ala., have called a meeting of the stockholders for March 21, for the purpose of electing directors and to consider the propriety of removing the plant from Birmingham.

The North Shore Traction Company of Lynn, Mass., have placed the contract for their new car shed with the Berlin Iron Bridge Company of East Berlin, Conn. The building will be 103 feet in width and 300 feet in length, constructed entirely of iron and brick in order to have the station fire proof. The Berlin Company are also making an addition to a car shed for the Wilmington City Railway Company, at Wilmington, Del.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., March 7, 1893.

In the haste and confusion of the expiring hours of the Fifty-second Congress conflicting accounts have been published concerning action on the bill to repeal that portion of paragraph 209, tariff of 1890, known as the McKinley bill, which provides that after July 1, 1893, a duty of 4 cents a pound shall be imposed upon block tin.

It was announced that the repeal had passed and this information had reached the Treasury Department of customs division as a current rumor. The Department, however, telephoned to-day to the clerk of the Senate Committee on Finance inquiring as to the status of this subject, and received the reply that the bill of repeal did not pass, therefore the duty on block tin after July 1, 1893, will be 4 cents a pound.

Representative Stone of Warren, Pa., having succeeded in passing in the House his bill for establishing a standard gauge for sheet and plate iron and steel was also successful in getting it through the Senate by giving his personal attention to its progress in that body. The bill also received the approval of the President and, therefore, is now a law.

The text of the bill as passed is as follows from the *Congressional Record*:

Be it enacted, etc., That for the purpose of securing uniformity, the following is established as the only standard gauge for sheet and plate iron and steel in the United States of America, namely (then follows the table of gauges printed in *The Iron Age* February 9).

And on and after July 1, 1893, the same and no other shall be used in determining duties and taxes levied by the United States of America on sheet and plate iron and steel. But this act shall not be construed to increase duties upon any articles which may be imported.

Sec. 2. That the Secretary of the Treasury is authorized and required to prepare suitable standards in accordance herewith.

Sec. 3. That in the practical use and application of the standard gauge hereby established a variation of $2\frac{1}{2}$ per cent. either way may be allowed.

Therefore in the future all sheet and plate iron and steel must conform to these statutory requirements.

The programme already outlined in *The Iron Age* in reference to the preparation of a tariff revision measure to be prepared in the Treasury Department, is meeting with some opposition from members of the Committee on Ways and Means, but Secretary Carlisle intimated to-day that he will give his attention to the preparation of a measure in accord with the policy of the administration as soon as he has his department reorganized.

The theory of the proposed measure will be free raw materials and a moderate reduction of customs duties on certain manufactured articles.

The Amalgamated Association of Iron and Steel Workers are already discussing the question of a scale for next year. Officials of that association, as well as of the Finishers' Association, say that the present scale is nearly satisfactory, but that some changes will have to be made at the close of the present year.

In the criminal courts at Pittsburgh, on Saturday the 4th inst., Hugh F. Dempsey and Robert J. Beatty, convicted of having poison administered to the non-union men at Homestead last summer, were each sentenced to seven years in the Riverside Penitentiary; Patrick Gallagher and J. M.

Davidson, confessed accomplices, were also sentenced, the first named receiving five years and the last three years. It is probable that the cases of Dempsey and Beatty will be carried to the Supreme Court.

The English Railway Rates Problem.

The subject of a just and adequate charge to impose for transportation facilities is one of the most complex and difficult of adjustment. This seems to have been found more difficult in England than in other countries, for the consideration of this question has been one of the most prominent that has vexed the lives of railway managers, government officials and traders. To discover a rate that will afford the railway companies a sufficient return to pay a fairly good dividend, and at the same time will not so tax the commodities transported as to endanger the existence of a moderate profit to the manufacturer or purveyor, is by no means an easy problem to solve. On the other hand, the company have first and foremost to consider what rate will obtain the former end, and the second consideration is apparently what the commodity transferred will sustain. Of course, as a private speculation the railway company have a perfect right to regard their own interests before other factors in the case, although the railway was built for the traffic and not the traffic for the company, but considering the fact that only by the co-operation of the railway company in providing a minimum of charges can the various industries flourish, it is not only to the benefit of the trade of the country, but also to the railways themselves to provide such. In regard to two of the most important industries of any country—viz., the iron manufacture and coal mining, the railway companies have strong ground to work upon. Iron products and coal must be transported and removed: it is an essential to their existence and development, and, no doubt, the companies, in many cases, take advantage of the knowledge of this fact, unless restrained by a legislative enactment. In other words, they levy charges as heavy as the commodity will bear, though in what way they can judge of this it is difficult to tell. What a certain class of manufacture will bear as regards transportation charges can only practically be judged by what margin remains as a balance between the cost of raw material, labor, &c., and the net selling price. To fix a rate, therefore, that an article could satisfactorily bear would involve the use of a very intricate sliding scale. Something approaching this seems to be the only way in which this difficult and complex question can be settled. It is certainly an anomaly that often, while iron and steel manufacturers are turning out their wares at a loss, the railway companies should still be receiving the same modicum for transportation charges as in times when trade is good and profits fairly large. An excuse for this can be found in the difficulty of altering the method adopted. The railway companies, in this respect, occupy a position enjoyed by few if any other public institutions—that of having a constant tariff through seasons of depression as well as through periods of prosperity. There is only one means we can suggest of reforming this unreasonable constancy of rates, and of making them more proportionate to the balance of profits received by the trader—viz.: That the minimum and maximum ratio should be fixed on the lowest and highest amounts received by the trades as the profit on the manufactured product, and that the rebate should be made by the company, or otherwise according to varying proportions of this balance. There are difficulties in such a

scheme, we are aware, and the adoption of it would incur an enormous amount of labor, but surely this would be preferable to the experience of endless litigation, which has prevailed in England of late. Hitherto English Government officials have refused to be guided in any way by the manner in which foreign railways are governed. This, to a limited extent, is right, but there is one phase of American railway administration and investment that should affect their considerations, and that is the fact that American investors are satisfied with a smaller dividend where they are paid. In France and Belgium, where the system of State railways obtains, the first consideration is, or should be, the fostering and development of all traffic, mineral and merchandise, by low freight charges, and the control of the railways by the State is undoubtedly, in many respects, beneficial to the country and its welfare. If a nation can look on while the trade of the country is hampered and checked by the greed of railway companies for their chief desire—namely, the dividend, while other countries are being aided by the facilities for transport placed at their disposal by the State, and are competing with the former country, and successfully, that nation must have at its head statesmen of little foresight and patriotism.

An Automatic Coal Jig.

The Tamaqua Mfg. Company of Tamaqua, Pa., have just demonstrated by a practical test the success of an automatic coal jig on which they have for some time been engaged.

It is expected that this new invention will be an important addition to modern coal-mining plants. The jigs at present in use must have operators constantly in attendance, and as skilled labor for this work is considered too expensive, it has been customary to employ boys, with very unsatisfactory results.

The new jig, it is claimed, will be automatic in every respect, requiring no attendance or watching, and may be run after the style of other breaking machinery, at very little cost. A fault very common to the ordinary jigs, that of throwing out coal with the slate, will, it is expected, be overcome in the new jig.

The scarcity of labor in Brazil since the emancipation act is felt all over the Republic owing to the indolence of the inhabitants, and is a serious bar to agricultural progress. A company of sugar growers have 30,000 tons of cane in splendid condition, but laborers to cut it down are not to be found. The British consul at Maranhão writes: "The labor question is the key to the whole position, and a most serious one. From all sides come the same complaint of produce having to be abandoned for want of people to gather it in." The proposition to introduce Chinese laborers is generally approved.

The greatest engineering project of the age is about to be submitted to the British House of Commons with the indorsement of eminent English and French engineers. It is a project to bridge the Straits of Dover with a cantilever bridge carrying two tracks. The bridge is to be 200 feet above the sea in the clear. The cost is estimated at \$163,750,000, and the period for construction seven years. While there is little doubt from an engineer's standpoint that such a bridge might be built, the risks from violent storms give little promise of a profitable investment.

It is reported that the experiments with the Talbot process at Birmingham, Ala., have proved successful.

The Production of Basic Steel.

The total make of steel and ingot iron from phosphorous pig iron during 1892 amounted to 3,202,640 tons, being an increase over the make for the previous 12 months of 322,105 tons. Of this, the basic Bessemer was 2,591,374 tons, and the basic open-hearth 611,266 tons. Of the steel containing under 0.17 per cent. of carbon the basic Bessemer produced 2,043,767 tons, and the basic open-hearth 428,225 tons. Seven hundred and seventy thousand tons of slag were produced with the steel, containing about 36 per cent. of phosphate of lime, nearly the whole of which was used as a fertilizer.

The makes of the various countries for the 12 months ending December 31, 1891, and December 31, 1892, respectively, were as follows:

	1891.		1892.	
	Total.	With under 0.17 % carbon.	Total.	With under 0.17 % carbon.
England...	436,261	350,818	406,839	317,583
Germany and Luxemburg...	1,779,779	1,314,781	2,013,484	1,618,783
Austria and Hungary...	221,212	95,907	288,122	212,408
France...	255,401	173,886	287,523	196,190
Belgium, Russia and United States....	187,882	111,172	206,667	129,028
Total....	2,880,535	2,046,558	3,202,640	2,471,992

It will be observed that the principal increase has taken place in Germany. The report is compiled by Percy C. Gilchrist.

Refined Steel by a New Process.

The Pennsylvania Steel Refining Company of Twenty-third and Filbert streets, Philadelphia, are placing upon the market a fine grade of steel manufactured by their new process for refining open-hearth steel into high-grade tool steel. The process is the invention of an instrument maker highly esteemed in this country. It is claimed that the steel is peculiarly adapted to lathe tools, planer tools and all kinds of machine tools, and for drill bits used in boring artesian, gas and oil wells, its especial qualities being ductility, toughness and uniformity. We are informed that the reports on it received from the different railroads and manufacturers using it have been favorable, some of the lathe tools made from it having been in use constantly for three months without redressing, thereby proving it to be long lived. It is also adapted to all kinds of cutlery, particularly surgical instruments. The process of manufacture is known as the "Damascus" process, and is protected by letters patent owned and controlled by the company in the United States and principal foreign countries. The present capacity at the works is from 2000 to 3000 pounds per day, but this capacity, it is expected, will be increased very shortly.

A large importer of paper stock in this city failed with about \$500,000 liabilities, according to report, the result of buying up the whole stock of India jute butts, carrying the stuff on a margin.

In all the great centers of the machine industry in Germany wages have declined until at present, according to trade union statistics, in most parts of the country workmen cannot earn enough to support their families.

MANUFACTURING.

Iron and Steel.

The Shenango Valley Steel Company, at New Castle, Pa., are now turning out about 400 tons of billets every 24 hours. Considerable new machinery is being put in, however, which, when erected, will considerably increase this output. John Stevenson, Jr., is general manager of this concern, and also of the New Castle Wire Nail Company.

The Arethusa Iron Works of New Castle, Pa., Geo. W. Johnson, proprietor, are tearing out the engine and roll trains in their department known as the "dinkie," and replacing the same with modern machinery. Jacob James is manager of this plant, which is being operated full time, and is one of the leading industries of the Shenango Valley.

The Rosena Furnace Company of New Castle, Pa., who are an interest identified with the Oliver Iron & Steel Company of Pittsburgh, have torn out the old style type hot-blast stoves, and are making arrangements for the erection of new fire-brick stoves of late design, together with an entirely new pattern of boilers, &c.

The new sheet-iron and tin mills now being erected by the Falcon Iron & Nail Company, Niles, Ohio, will soon be completed and ready for operation. The entire plant is being equipped with the best appliances and the mills will be modern ones throughout. The plant covers about 5 acres of ground, and the concern expect to be making sheets in their new works before this month is out and black plates for tinning purposes early in April.

The new works now under erection by the New Castle Steel & Tin Plate Company, of New Castle, Pa., are being pushed to completion and the concern expect to be ready for the spring trade. Their plant throughout will be equipped with the best machinery in the market, and the new firm will have every facility for the manufacture of tin andterne plates. The general manager is Geo. Greer, under whose supervision the new plant is being erected.

The blast furnace of the Riverside Iron Works, at Steubenville, Ohio, was put in operation week before last, and their tube department was put in operation last week. Every department of the large plant of this concern is now in full operation, with the exception of their nail factories. During the shutdown many improvements were made, especially in the Bessemer steel plant. In this department the shears were removed 28 feet further away from the rolls, and on the pit side of the rolls a tunnel was built, by which the concern are enabled to roll a billet 88 feet long and of any dimensions. The old heating furnaces were torn out and replaced with two new soaking pits. Other minor changes effecting a better utilization of space were also made. The improvements now in progress are in plate mill D, which will be a duplicate of plate mill C. This new department is expected to be ready for operations about April 15 next. The erection of a lap-weld plant in the tube mill was also recently commenced.

The Raney & Berger Iron Company of New Castle, Pa., have been operating their furnace on Bessemer, but a short time ago changed off and are now turning out their well known standard brand of Norway foundry iron. Their furnace will go on Bessemer again at an early date.

It is stated that the plant of the Union Rolling Mill Company, at Newburgh, Ohio, has lost only three days since last August, these being Labor Day, Christmas and New Year's. At present this plant is being operated double turn in all departments.

The Vesuvius Iron & Nail Works of Moorhead Brother & Co., at Pittsburgh, which have been in partial operation only owing to trouble with the employees, are now on double turn in all departments, muck bar being the principal output.

Pickands, Mather & Co. of Cleveland, Ohio, have recently examined several sites in that city with a view to the erection of a blast furnace with a capacity of about 250 tons per day. The proposition to tear down the other furnace and replace with a thoroughly modern plant was discussed, but it was decided that this site would not afford the amount of room required. The question of location of the plant will be decided upon as soon as possible and the plans for the new structure will embrace every detail necessary to the economical production of pig iron. It is stated that the new stack will be operated on Bessemer and foundry pig iron alternately.

We have already referred in these columns to the organization of The Cleveland Steel Casting Company of Cleveland, Ohio, with a

capital stock of \$100,000. This concern have purchased 10 acres of land in that city and have let a contract for an iron building about 100 x 300 feet in size, which will be so constructed that additions can be made to it whenever desired. A 10-ton Siemens-Martin open-hearth furnace and a 20 ton electric traveling crane will be included in the equipment of the plant.

The Goff Steel Company, Limited, succeed the Iron & Steel Band Company of Pittsburgh, the change being merely a reorganization with some slight changes in the holding of the stock. E. M. Goff is president and J. W. Goff, Jr., secretary and treasurer. The offices have been removed from the Fidelity Building to Room 703 Times Building, in that city. The works of the concern are located at Wilson, Pa., the output being steel and galvanized iron hoops and bands.

Josephine, C. B., Wm. A. and Martha E. McKinney, heirs of William McKinney, deceased, entered an ejectment suit recently against Carnegie Brothers & Co., Limited, owners of the Edgar Thomson Steel Works. The plaintiffs claim ownership of 5 acres of land adjoining the eastern boundary of Braddock, between the Pennsylvania and Baltimore & Ohio railroads. They claim that since William McKinney died, in 1887, the defendant company has been gradually taking possession of the ground.

Unfavorable weather has interfered during the past few months with progress in building the new open-hearth plant and the great slabbing mill of the Pennsylvania Steel Company, at Steelton, Pa. The steel plant embraces six 35-ton tilting open-hearth furnaces placed in two rows facing one another. The whole is commanded by overhead traveling cranes which are to carry the ladles to one common casting department. One of the furnaces is approaching completion, the shell of another is nearly finished, while the others are in different stages of advancement. The universal slabbing mill will be very similar to the Homestead train. The two sets of Tod engines for driving horizontal and vertical rolls are in position, and the housings of the train are in place.

No. 3 furnace of the Crane Iron Company, at Catasauqua, Pa., has blown out, leaving but two furnaces in blast at this plant, one having been blown out recently.

The Wheeler Furnace, at Sharpsville, Pa., has started up again after a shutdown of several months.

The Rome Furnace, at Rome, Ga., has gone into blast after a suspension of 27 days.

At the annual meeting of the stockholders of the Lackawanna Iron & Steel Company, at Scranton, Pa., the following directors were elected for the ensuing year: Samuel Sloan, New York; William E. Dodge, New York; Henry A. C. Taylor, New York; John I. Blair, Blairstown, N. J.; James Blair, Scranton; W. W. Scranton, Scranton; Walter Scranton, East Orange, N. J.; Frank Thomson, Philadelphia; Edward S. Moffat, Scranton.

Sternbergh & Son of Reading will have three exhibits at the World's Fair in Chicago. Their main exhibit in the Manufactures' Building, and their exhibit of railway track bolts and other fastenings in the Transportation Building, and an exhibit of their belt lacing machine and products in the Machinery Building, comprising all told a floor space of nearly 450 square feet, are intended to represent this well-known firm.

The South Milwaukee Malleable Iron Works of South Milwaukee, Wis., are newcomers in the malleable iron field, although the members of the company have had practical experience in connection with other establishments. Their foundry has but recently been started, but is running satisfactorily with an encouraging volume of business.

The East Chicago Iron & Steel Company, East Chicago, Ind., have added an 8-inch train of rolls to their equipment. The new mill is working very satisfactorily and the company are now able to make a much larger assortment of bar sizes, thus putting them in a better position to compete for general business. The company maintain a Chicago office in the Monadnock Building.

The Eagle Horseshoe Company of South Milwaukee, Wis., are remodeling their heating furnace and expect to have it completed and the works again in full operation by the middle of April. They purchase the horseshoe bar and work it into shoes ready for the market.

The Mahoning Valley Iron Company broke a 72-inch roll last week, and the set of rolls at Brown-Bonnell Iron Company also broke.

A reduction in wages at the plant of the Catasauqua Mfg. Company, Catasauqua, Pa., went into effect on the 4th inst. Puddlers' wages have been reduced from \$3.65 to \$3.25

per ton, skilled workmen 10 per cent. and laborers \$1.10 to \$1 per day.

The Atlantic Iron Works, Sharon, Pa., nail-plate mills and nail factory resumed operations last week after a brief idleness.

The bill introduced in the Ohio Legislature amending the incorporation laws so that it will not be necessary for any corporation to pay in all its capital stock before the nominal capital stock can be increased, passed the House last week. It was introduced in the interest of the Ohio Steel Company of Youngstown, who desire to increase their capital stock to \$1,000,000 before paying in the original amount.

Wm. Tod & Co., Youngstown, Ohio, have issued a circular giving detailed description of the universal slabbing mill engines now being constructed at their shops for the Pennsylvania Steel Company. The arrangement consists of a pair of 42 x 60 inch reversing engines, geared to drive the horizontal rolls, and a pair of 26 x 30 inch reversing engines, directly connected to the driving shaft of the vertical rolls. The gears are of steel, 36-inch face inside of shrouding, 8-inch pitch, and are 4 feet and 10 feet pitch diameter. These engines are all rigidly connected on a continuous bed and occupy a space 63 feet long and weigh 300 tons. Wm. Tod & Co. are erecting a new cupola.

The new buildings which have been under course of construction by the Brown-Bonnell Iron Company are rapidly nearing completion. The engines are now being erected and it is expected the mills will be started up April 15.

Machinery.

The Pierrepont Boiler Company of Pittsburgh, with a capital of \$1000, were granted a charter last week. The directors are Julian Kennedy, Geo. Reeves and Jas. Pierrepont. It is understood that this new concern will soon put on the market a new design of water-tube boiler.

The Veness Machine Company of Pittsburgh have been granted a charter, with a capital of \$10,000. The incorporators are Alfred E. Veness, Wm. R. Hamilton and Wm. Seth Silkinsburg.

Samuel Dyke, formerly of the Armitage Herschell Company of Tonawanda, N. Y., has almost completed arrangements for leasing land near the New York Central & Hudson River Railroad tracks, at Niagara Falls, N. Y., and will build a boiler manufacturing plant there as soon as arrangements can be made to put in a spur of track.

Lannon & Co.'s large foundry and machine shops, at Pueblo, Col., were burned last Sunday; loss \$100,000. The same day Fred. J. Meyers' large architectural iron works in Covington, Ky., were burned.

The Oneida (N. Y.) Mfg. Chuck Company have elected the following officers: Trustees, H. L. Rockwell, George Schubert, August Schubert, F. P. Klock; president, H. L. Rockwell; vice-president, August Schubert; secretary, F. P. Klock; treasurer, George Schubert. C. F. Marquis has been appointed superintendent of the chuck department, and August Schubert superintendent of the gear and cast department.

The Vulcan Iron Company, Limited, of New Castle, Pa., manufacturers of castings and machine work, have recently added to their plant a department for the manufacture of ingot molds. The iron will be purchased from the Crawford Iron & Steel Company of that city.

Tinius Olsen & Co. of Philadelphia have been unusually busy for some months past and have just completed orders as follows: One 100,000-pound autographic testing machine for the Wm. Cramp & Sons Ship and Engine Building Company, one of same capacity to the Baldwin Locomotive Works, one of 300,000 pounds for the Pencoyd Iron Works, and one of 100,000 pounds for the West Superior Rolling Mill, West Superior, Minn. They have also built one 100,000-pound automatic testing machine for the Central Iron Works, at Harrisburg, and one for J. H. Poole & Sons of Baltimore; also one wire-testing machine for the Washburn & Moen Company and one cement testing machine for the Michigan University, at Ann Arbor, and one for the Pennsylvania University in Philadelphia. The firm are now busy on machines for exhibition at the World's Fair in Chicago.

The Moore Mfg. & Foundry Company of Milwaukee, Wis., have outgrown their facilities, and being unable to secure room for further expansion in their present location have decided to move to South Milwaukee. They will begin the erection of new buildings as soon as the weather permits. The buildings will be substantial brick structures and of double the capacity of the existing works. The machinery will be removed to the new location by the latter part of the summer at

furthest. The company will dispose of the buildings they now occupy, which are suitable for general manufacturing purposes.

The Red Jacket Mfg. Company, Davenport, Iowa, have doubled the capacity of their works within the past year and look forward to another very prosperous season. Their specialty is the Red Jacket double-acting force pump, for domestic or farm use, by hand or in connection with windmills or other power, and for operating to any depth. The company have pumps in use operating on wells to a depth of 700 feet. A new tank pump, for use in connection with threshing outfits, will shortly be placed on the market.

The Bucyrus Steam Shovel & Dredge Company, of Bucyrus, Ohio, have completed their new works at South Milwaukee, Wis., but have been so pressed with contracts that they have been unable to take the time to remove their machinery to the new location. It is the intention of the company to add some new lines to their specialties after they get started at South Milwaukee.

At a recent meeting of the directors of the Cumberland Steel & Iron Shafting Company of Cumberland, Md., the purchase of a site for the plant was ratified. Arrangements were made for the construction of the plant and the work will be commenced as soon as contracts can be made.

The business of the James E. Thomas Company, founders and machinists, of Newark, Ohio, was established in 1867 by James E. Thomas, and incorporated January 17, 1893, under the title of the James E. Thomas Company. As stated above, the concern are iron founders, their principal business being the manufacture of ingot molds for steel plants and other heavy castings, of which they are now turning out about 20 tons per day. The concern have a very modern plant equipped with power cranes throughout.

A. J. Weed & Co. of 106 Liberty street, New York, are now building a vertical marine engine in three sizes— $\frac{1}{2}$, 1 and 2 horse-power. These engines are especially designed for those amateurs who desire to build their own engines, or such parts of them as their facilities will allow. With that end in view the castings are to be had, not only in the rough, but also in various stages of completion. In one set all parts for which the planer is necessary are machined, thus giving the amateur who has only his lathe his castings ready prepared. In another set the cylinder and steam chest are bored and faced, the guide is bored, and in general the more difficult lathe work is done. In another set, in addition to that which is completed in the other sets, the bearings are babbitted, eccentric straps bored, and eccentrics, piston, cross head, slide valve and fly wheels are turned. As will be seen, this allows a selection of the parts in such stage of completion as will best suit the facilities of the builder. The engine is well designed and proportioned in every respect.

The E. W. Bliss Company of Brooklyn, N. Y., announce that in consequence of their increased and improved facilities they are in a position to offer their adjustable power presses, Nos. 10, 12, 12 $\frac{1}{2}$, 18, 19 and 20, at reduced prices. These presses are kept in stock and prompt shipment can be made.

The National Machinery Works, Tiffin, Ohio, have been reorganized, with a capital stock of \$500,000. The works will be enlarged to double their present capacity.

The capital stock of the P. H. & F. M. Roots Foundry Company, at Connessville, Ind., has been increased to \$700,000. The intention is to enlarge the plant, so that the capacity will be double what it now is.

The A. W. Stevens & Son Company, have been incorporated at Albany, N. Y., for the purpose of manufacturing grain-threshing machines, separators and agricultural implements, at Auburn, N. Y. The capital stock is \$750,000.

The Menomonee Mfg. Company have been formed at Menomonee, Wis., with a capital of \$5000, to operate a foundry and machine shop at that place.

The American Engine Company have closed their works at Bound Brook, N. J. They manufactured high-speed engines, which did not find a ready market.

The Pratt & Cady Company of Hartford, Conn., have voted to increase their capital stock from \$200,000 to \$400,000.

The entire plant of the J. N. Roberts Mfg. Company, at Poplar Bluff, Mo., has been burned. The loss is about \$40,000, with an insurance of \$10,000.

A. & P. Roberts & Co., Pencoyd Iron Works, Pencoyd, Pa., are erecting a new foundry, 80 x 42 feet in size, one story high.

The Stark Machine & Tool Company of Buffalo, N. Y., manufacturers of presses, dies and tools for tanners, find it necessary to work 90 hours per week to keep up with orders.

They have the contracts for fitting up two complete stamping plants, in addition to numerous smaller outfits.

The works of the Racine Malleable & Wrought Iron Company, at Racine, Wis., have been partially destroyed by fire. The total loss is \$45,000, on which there was an insurance of \$25,000.

The Lloyd Booth Company, Youngstown and Warren, Ohio, are making large lever shears to be used by the Illinois Central Railroad Company, at their new shops in Chicago. They are also building shears for Union Iron & Nail Company, and East Chicago Iron & Steel Company. They are also building a set of Morewood tinning appliances for the Blairsville, Pa., Tin Plate Company. The Lloyd Booth Company are erecting a large new foundry at Youngstown.

Miscellaneous.

The New Castle Asphalt Paving Brick Company of New Castle, Pa., are making preparations to put their new plant in operation. It is said the concern have already booked a large number of orders.

Articles of incorporation have been filed at Duluth, Minn., by David T. Adams of Duluth, Peter L. Kimberly of Sharon, Pa., and John T. Jones of Iron Mountain, Mich., for the Adams Mining Company, whose capital stock at \$300,000.

Among recently authorized corporations in Illinois are the following: The American Smoke Preventer Company, at Chicago; capital stock, \$150,000; for the manufacture of smoke preventers; incorporators, William R. Mills, Charles Smith and Weston O. Knowles. The International Automatic Air-Brake Coupler Company, at East St. Louis; capital stock, \$10,000,000; for the manufacture of automatic air-brake couplers and connections of air for railroad cars and other vehicles; incorporators, William R. Harris, John H. Wear and Lewis Bieman. The Marion County Rapid Transit Company, at Centralia; capital stock, \$75,000; to build and operate an electric railway and to furnish light, heat and power; incorporators, S. N. Pierce, O. V. Parkerson, C. B. Ellis, L. Sonnerville, John F. Sugg, S. J. Smith and J. D. Telford. The Watson Down Draft Furnace Company, at Chicago; capital stock, \$100,000; for the manufacture of furnaces; incorporators, Edwin J. Noble, George F. Westover and M. W. Geisinger. The Indurated Fiber Ware Company, at Chicago; capital stock, \$10,000; for the manufacture of merchandise and to conduct a commission business; incorporators, George H. Best, Lowther Ferris and Harry T. Lockwood. The American Change & Register Company, at Chicago; capital stock, \$40,000; for the manufacture of cash-registering machines; incorporators, Charles E. Braden, George E. Hopkins and John G. Elliott. The Illinois Refrigerator Company, at Chicago; capital stock, \$50,000; for the manufacture of refrigerators and wooden ware; incorporators, J. B. Markey, E. A. Smith and J. F. Hanehan. The Royal Columbia Heat Radiator & Automatic Lamp Filler Company, Chicago; capital stock, \$20,000; incorporators, Ambrose A. McKey, James P. Hoselton and Alexander N. Murray. Post Metal Company, at Chicago; capital stock, \$50,000; for the manufacture of metal specialties and to conduct a general transportation business; incorporators, Henry C. R. Post, Hugh L. Burnham and Oscar T. Lindrooth. The Coal-Saving Grate Company, at Chicago; capital stock, \$50,000; for the manufacture of grates; incorporators, Henry Peterson, Carl H. Leopold and J. H. Kraft. The Ramsey Self-Lock Nut & Mfg. Company, at Ramsey; capital stock, \$10,000; incorporators, H. E. Lantz, S. L. Neeley, George W. Nichols, J. L. Furnear.

The Reliance Wire Works Company of Milwaukee, Wis., have adopted the new name, Reliance Wire & Iron Works, and have removed their factory to 186, 188 and 192 East Water street and 17 and 19 Erie street. Their facilities have been considerably enlarged in their new quarters. They manufacture wire lath, elevator inclosures, iron stairs, railings, grills, shutters, window guards, office railings, roof crestings, &c., in any finish desired. Frank A. Hall is president of the company.

The Detroit Electrical Works, Detroit, Mich., have recently added to their machine shop two 10-ton traveling cranes and one 15-ton jib crane. These cranes were recently successfully tested with loads 50 per cent. in excess of their rated capacity. They were manufactured and erected, together with the traveling crane tracks and supports, by the Detroit Foundry Equipment Company, Detroit, Mich.

The Youngstown Bridge Company has contracted to construct bridge over the Bohemia River in Cecil County, Md., which will be 1352 feet long and 17 $\frac{1}{2}$ feet wide.

The Columbus Wheel Works, at Columbus, Ohio, have been burned, at a loss of \$35,000; insured.

TRADE REPORT.

So far as can be learned through different sources, practically nothing has been done in the way of Lake Ore, aside from the purchase of some Bewabik Ore by one of the leading Pittsburgh interests. The other large Western concerns have not contracted, not even those which are known to be identified with Ore interests to a considerable extent. Buyers are in no hurry, while sellers show little inclination to move before they have arranged for freight.

The long-expected weakening of Southern Pig-Iron producers appears to have come. It is reported that a sale of 12,000 tons of lower grade Irons was made to a Louisville Pipe works on the basis of \$8 for Gray Forge, Birmingham. There are indications of very low prices at Chicago, Detroit and St. Louis, which shows that an increasing number of Southern furnacemen are following the lead taken some time since by those Northern furnaces who have been making cheap Irons in consequence of the lower cost of non-Bessemer Lake Ores.

So long as it costs only from \$11.25 to \$12.50 per ton to make Iron at different lake ports, with a high percentage of make of the best grades, the Southern producers, even with an \$8 cost, cannot hold their own in markets which they can reach only by paying \$4 and upward freights, particularly since the majority of them make a heavy percentage of Gray Forge and lower grades. With the rapid shrinking of the market for Mill Irons the question of the manufacture of Steel becomes increasingly important. Special interest attaches therefore to the reports of the success of the experimental trials of the Talbot process at Birmingham.

The enormous consumption of Soft Steel seems to be again catching up to the supply, and in consequence Soft Steel Billets in Pittsburgh for early delivery are firm.

Very little specific news is allowed to reach the public on the volume of transactions of the Western Steel Rail mills, who, it is expected, will secure quite a good deal of business this year. The Eastern mills have taken about all the work which is to be looked forward to for the first six months from all the leading roads, the majority of which have even contracted for the whole of their requirements for the year. From present indications 1893 does not promise to do much better than 1892.

Shrewd observers predict that this year will be much better for those who are sellers of material for rolling stock and equipment than for the makers of Steel Rails, so far as volume of business is concerned. Even now the Bar trade in the West is active, although the complaint of low prices is heard on every hand.

The Plate trade in the East is in the extraordinary position that there is continued eagerness for work, in spite of the great orders given out recently. Very low prices have been made.

Reports from the West indicate that the volume of business being done this spring in the Wire trade will be enormous, a fact which should react favorably on Soft Steel.

In metals, the Tin market has reflected to some extent the muddle over the reports concerning the repeal of that clause of the McKinley act which imposes a duty after July 1. When the truth became known there was an advance, which has been held.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., }
PHILADELPHIA, Pa., March 7, 1893. }

The market shows very little change from last week, although such as there is is rather in the direction of better prices. The demand would be considered good in ordinary times, but with such a large capacity for production, and with so much delay in specifying, mills are all the time close to the end of their order books. Prices, therefore, are very feverish and in some cases during the past few days have been quoted lower than ever. The feeling to-day is that a line must be drawn somewhere, and that line appears to be at the inside quotations named below. Some leading concerns are refusing to meet the figures named by others, on the ground that business on such terms must inevitably result in loss; and sooner than do that they will close their mills. The improvement, therefore, is somewhat of a negative character, and is comprised rather in refusing prices which were recently accepted, rather than on actual business at advanced prices.

Pig Iron.—The market shows no change from last week, and in all ordinary transactions prices have been well maintained. Anything not strictly first class in point of quality would probably have to be shaded a little, but at prices quoted below there is a market for almost anything that may be offered. The demand is chiefly for standard brands, and these are absolutely firm, but when it comes to an off grade or a large lot which can only be placed in certain quarters more or less dickering is required to get it through. With this exception the market is singularly monotonous; makers do not feel warranted in putting up their prices, and they certainly won't put them down so long as they are as well sold up as they are to-day. Low-grade Irons are wanted at about 25¢ less than quoted rates, but as no one seems inclined to meet bids of this character, what business there is at quoted rates, say \$12.50, Philadelphia, or its equivalent at other points. Makers claim that there is no money in the business at present prices, but there is nothing in sight to warrant predictions of anything better in the immediate future. On the other hand, solvent concerns are determined to go out of the business rather than to submit to lower figures, so that even if prices do not improve there is hardly a possibility of them working to a lower point. General quotations as follows for Philadelphia and equivalent deliveries, with 25¢ to 50¢ less on Southern brands at Harrisburg and intermediately to Baltimore:

American Scotch, No. 1X.....	\$17.00	@	\$17.25
American Scotch, No. 2X.....	16.00	@	16.25
Standard Penna. (Lake Ore), No. 1X.....	14.75	@	15.25
Standard Penna. (Lake Ore), No. 2X.....	14.25	@	14.50
Standard Virginia, No. 1X.....	14.75	@	15.00
Standard Virginia, No. 2X.....	14.00	@	14.25
Virginia and Southern, No. 1X.....	14.00	@	14.50
Virginia and Southern, No. 2X.....	13.25	@	13.50
Standard Penna. and Virginia Forge.....	13.00	@	13.25
Ordinary Forge.....	12.50	@	12.75

Bessemer and Low Phosphorus Pig.—The market is somewhat more active, but prices are very unsatisfactory, and vary according to quality, quantity, point of delivery, &c., but in a general way \$15.50 @ \$16.25, delivered, is quoted for Bessemer, and \$17.50 @ \$18 for best qualities for Open-Hearth Steel Purposes.

Steel Billets.—Market dull but prices have been very firm. As high as \$24.25 @ \$24.50, delivered, has been quoted for Western Steel, but buyers made no response, so that quotations based on actual sales are an unknown quantity. It is

thought that a firm offer of \$24, Schuylkill Valley points, would bring them, but bids even at \$24 are hard to get, as mills are pretty well covered and have no need to buy largely unless prices are made to suit them. Eastern mills quote about \$24 f.o.b. cars, but \$24.50 @ \$24.75, delivered, would probably be an acceptable figure on a low freight, providing the order was for something worth while.

Steel Rails.—Demand chiefly for small lots, but there is no scarcity of work for the next 60 days, with fair prospects of its continuance during the summer months. Prices steady at \$29, f.o.b. cars at mills.

Bars.—Demand barely enough to go around and prices are still at the very lowest point, say 1.62½¢ @ 1.67½¢ for Best Refined (city deliveries) and 1.55¢ @ 1.60¢ at interior points. There is nothing in sight that looks like better prices and mills are not very actively employed even at the low figures named. Steel Bars are quoted at 1.65¢ @ 2¢, according to quality requirements.

Skelp.—Business moves along at about 1.55¢, delivered, but there are plenty of sellers at the price named and orders for large lots, and a good delivery could probably be done at a shade less.

Plates.—There is nothing encouraging to report in this line, except that prices are not cut quite as severely as they were two or three weeks ago; 1.75¢, delivered, for Tank Plates, has been an ordinary price, and in some cases even less than that has been named for good-sized lots, but there is a disposition to make 1.75¢ a very inside figure, and from that to 1.80¢ for medium-sized lots. Shell and Flange have also been severely cut, but as there is room for so much variation in quality, it is hardly safe to name actual figures, but as much as 10¢ and 15¢ has been knocked off from what are supposed to be ordinary quotations. Orders for immediate specification are badly wanted at some mills, which is said to be the reason for the low figures alluded to. General quotations, delivered, are about as follows:

	Iron.	Steel.
Tank Plates.....	1.80 @ 1.85¢	1.80 @ 1.85¢
Shell.....	2.00	@ 2.10¢
Flange.....	2.70 @ 2.90¢	2.25 @ 2.40¢
Fire Box.....	3.00 @ 4.00¢	2.50 @ 2.70¢
Special qualities.....	3.25	@ 3.75¢

Structural Material.—Orders are not very plentiful, but there is a great deal of work on hand, so that mills are running full time in most of their departments. Prices are irregular but are usually quoted about as follows, delivered: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.80¢ @ 1.85¢; Universal Plates, 1.80¢ @ 1.90¢

Sheets.—At extremely low figures there is plenty of business, but manufacturers who have a reputation for making a first-class quality, are unable to meet buyers' requirements as to price and are therefore taking very few orders. Those who are willing to make prices to suit get plenty of business, but it is a question whether it is worth having. Best qualities in small lots is quoted about as follows:

Best Refined, Nos. 14 to 20.....	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26.....	3.15¢ @ 3.20¢
Best Refined, No. 27.....	3.30¢ @ 3.40¢
Best Refined, No. 28.....	3.40¢ @ 3.50¢
Common, ½¢ less than the above.	

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ½¢ lower than are here named:

Best Soft Steel, Nos. 14 to 16.....	2½¢ @ 2½¢
Best Soft Steel, Nos. 18 to 20.....	3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 25 to 26.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 27 to 28.....	3½¢ @ 4¢
Best Bloom Sheets, ½¢ extra over the above prices.	

Best Bloom, Galvanized, discount.... 70 and 5 % @ 70 and 10 %

Old Material.—Business is fair in some specialties; others dull and neglected. There is no change in prices, and, on the whole, they may be called fairly steady at last week's figures, viz: Old Iron Rails, \$18 to \$18.50, delivered; Old Street Rails, \$19 to \$19.50; Old Steel Rails, \$15 @ \$16; No. 1 Railroad Scrap, \$15.50 @ \$16, Philadelphia, or for deliveries at mills in the interior, \$16 @ \$16.50, according to distance and quality; \$8 @ \$9 for clean new No. 2 Light Scrap; \$7 to \$7.50 for old No. 2 Light Scrap; \$11 @ \$12 for Machinery Scrap; \$11.75 @ \$12.25 for Wrought Turnings; \$8 for Cast Borings, and nominally \$22 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

Wrought-Iron Pipe.—Prices remain at the lowest yet quoted, and as there is no specially heavy buying there are no immediate indications of improvement. Nominal discounts are as follows, but 5 % @ 10 % extra is easily secured on the right kind of an order: Butt, Black, 57½ %; Butt, Galvanized, 50 %; Lap, Black, 67½ %; Lap, Galvanized, 57½ %; Boiler Tubes, 67½ %, all sizes, new list; Casing, 62½ %, new list.

At the annual meeting of the Catasauqua Mfg. Company it was decided that the Philadelphia agency for the sale of their products should be intrusted to Charles K. Barns & Co., 224 South Fourth street. Mr. Barns is too well known to the trade to need further introduction, and in his experienced hands the interests of the company will doubtless be well cared for.

Cleveland.

CLEVELAND, OHIO, March 6, 1893.

The Iron Ore market is still the all absorbing topic of conversation in Iron centers. Rumors of sales of '93 Ore are made from day to day, but they do not bear investigation. In the big Iron centers down in the Perry Payne Building, where a majority of all the Ore sold in the Northern country is disposed of, it is strenuously denied that sales have taken place. This much may be said though. The Iron Ore men and the furnacemen are drifting toward each other. The vessel owners form the opposing obstacles. It is pretty generally admitted to-day that the Escanaba rate will not go beyond 80¢, with 70¢ or 75¢ per ton hoped for—and that Ore is likely to come down from the head of Lake Superior for something like \$1.05 @ \$1.10. It is not difficult to obtain reports of sales, but it is something beyond human power to confirm them. There have been sales. They were spoken of in last week's report from this city, but they were special Ores, bought for special purposes. If they are to be taken as an indication of rates for 1893 it may be said, with much emphasis, that good Bessemer Ores, assaying close to 64 % in iron and very low in phosphorus, are to be sold at figures very close to \$4 per ton with the probabilities of \$3.90, perhaps \$3.85, per ton being nearer the actual selling figures. Non-Bessemer will sell for \$3, which is close to the maximum, with certain cheaper grades going at \$2.75 per ton. The output for 1893, despite the amount of Ore on the docks, is estimated at about 9,000,000 tons. It is a safe estimate that the shipments will closely approximate that amount notwithstanding the fact that the season opens with an immense amount of unsold Ore—principally non-Bessemer, by the way—on the docks. The vesselmen still hold the golden key to the situation. Their unlimited faith in their ability to pay dividends on the strength of the big increase in coal and grain shipments is offset by the claim of the Oremen that they are not entirely dependent, and that, under the present circumstances, if Oremen and

furnacemen come together, all talk might as well be abandoned. It is a peculiar position for all concerned, and may be cleared up at a moment's notice or may continue for years.

A local paper whose interests are wrapped up with those of the vesselmen says to-day:

"There is very little of interest to be said of mining shares, the market still ruling dull at low prices. No new dividends are heard of. The announcement some time ago that Lake Superior would probably pay \$2 a share was unofficial, and there is as yet no definite knowledge of a dividend. A little anxiety was caused early in the week by the reports of a flood at the Ashland Mine, Gogebic range, and sensational dispatches about danger of the Norrie being flooded also. The Messrs. Hayes, owners of the Ashland Mine, who have been in Cleveland consulting with their sales agents relative to business for the coming season, say that the dispatches about the flow of water in their mines were exaggerated. The water, which was encountered while blasting a good deposit of Ore on the eleventh level of the mine, reached the tenth level and drowned out a big pump on that level, but was under control on Saturday. The mine managers expected the flow of water and expected to be able to take care of it, but the volume was greater than anticipated and extra exertions were required for a few days.

"The railways carrying Coal to lake ports from the mines of Ohio and Pennsylvania have not as yet fixed freight rates, and until this question is settled there can be no general movement toward sales of Soft Coal. Three boats have been chartered for a first load to Milwaukee on the opening, and the rate, although not made public, is said to be 55¢. It is expected that the rate on the first loads of Hard Coal from Buffalo to Milwaukee will be 60¢."

Iron Ore.—During the past week 32,691 tons of Ore were sent on to the furnaces, against 33,357 tons for the same week last year. The difference in figures is due exclusively to the lack of cars. The improvement in the demand for Bessemer Iron has operated as an incentive to encourage the demand from the furnaces and to clear up the raw material on the docks. In February 127,000 tons of Ore were shipped to the furnaces, against 128,000 for the same week in 1892. This would indicate that values are very much the same and that the demand for Ore from the furnaces will suffer no disparagement in comparison with last season's records.

Pig Iron.—The market is not active, but is quite firm at the new quotations announced last week. Bessemer Iron is still in good favor and there is a demand for Foundry Iron that, while not apparent on the surface is still very apparent. Bessemer may be quoted to-day at \$13.75 @ \$13.85, with a good steady demand. The inquiry for Foundry Irons is also better. Gray Forge at \$12.50 @ \$12.60 is asked for by many prospective buyers. A genuine season of activity in the demand for Irons of these grades would invest the whole market with an appearance of life.

Scrap.—The market is without special feature. The demand is limited and prices are unchanged.

Manufactured Iron.—The market continues to improve, and seems likely to do so for several weeks to come. Local dealers quote Common Bar at 1.55¢ @ 1.60¢ from the mills and pronounce the demand good.

Old Rails.—The inquiry for Old Americans is only moderate. Sales at \$19 @ \$19.25 are reported, but the amounts involved were small.

Nails.—Dealers quote Steel Wire Nails at \$1.55 and Cut Nails at \$1.50 in stock. Cut Steel Spikes are up 10¢ per keg, and are now quoted at \$2 per keg.

Muck Bar.—The demand is fair, although the amount of business being done is small. No. 1 Muck Bar is quoted at \$24.25 @ \$24.50, Cleveland, delivered.

Freights.—Ore: Cleveland to Valley Points, 62½¢; Cleveland to Pittsburgh, \$1.05. Pig Iron: Valley Points to Cleveland, 60¢ per ton; to Pittsburgh, 60¢, Muck Bar, Blooms, Billets, Scrap, Iron and Steel Rails, Old Wheels, &c.: Valley Points to Cleveland, 70¢ per ton; to Pittsburgh, 75¢ per ton; to Boston, \$3.50 per ton; to New York, \$3.10 per ton; to Philadelphia, \$2.70 per ton.

The offices of the Penokee and Gogebic consolidated mines and those of the Aurora Mining Company have been moved back to Milwaukee.

Local agents of the Minnesota mines say that the output in that district this year will surprise every one. When 3825 tons of Ore are taken from the Minnesota mines in one day it behooves the vesselmen to look for engagements from Two Harbors.

Baltimore.

BALTIMORE, March 6, 1893.

The prospect for the month ahead of us is encouraging on the whole, although sellers will be compelled to forego any hope of increased prices and content themselves with quantity. Plate Steel has been fairly active, and a few good specifications have been placed during the last week.

Bar Iron.—Has been holding its own, and our quotations for last week still hold good—1.85¢ @ 2¢ from stock and 1.80¢ @ 1.85¢ from mill.

Plates.—As stated above, the market in this class of material is moderately satisfactory as regards quantity, but a specification of any size calls forth prices which we do not think it policy to name. Our quotations for this week are: Tank Iron or Steel, 1.85¢ @ 1.95¢; Shell, 2.20¢ @ 2.25¢; Flange, 2.40¢ @ 2.45¢; Fire Box, 2.55¢ @ 2.60¢; Marine, 2.55¢ @ 2.60¢.

Merchant Steel.—All grades of this material have been moving slowly with no large inquiries in the market. Machinery Steel, 2.17½¢ @ 2.30¢; Tire Steel, 2.20¢ @ 2.25¢; Toe Calk, 2.35¢ @ 2.45¢; Spring Steel, 2.50¢ @ 2.60¢.

Light Sheets.—Buying from stock has been fairly satisfactory and there is no disposition to lower prices. No. 10, 2.45¢; No. 12, 2.45¢; No. 14, 2.50¢. Usual extras for lighter gauges.

Tubes and Pipe.—Boiler Tube orders for new work are scarce, although orders from stock for repair work are fair in quantity. We still continue our quotations as last made, though they are but nominal since they are shaded in many instances. From stock 65 % for 3-inch, 60 % for 2-inch. Mill orders 5 % additional.

Louisville.

LOUISVILLE, March 6, 1893

There have been a number of sales, but at low prices. The market is quite demoralized and transactions have been made at as low as \$8 for Gray Forge. Furnaces selling make a strong point of making deliveries as short as possible, but transactions have been closed running well into the year and in some instances throughout the year on the above basis. Purchases have been quite large and in one instance nearly 12,000 tons were placed. Inquiries

are also general with deliveries for this year. Buyers are trying to purchase into 1894 and reports, especially from the Chicago district, show that furnaces there are quoting for several months beyond 1893. It is impossible to predict what the market will be, but it does not seem possible that prices can go lower; if the market continues on the present basis some furnaces must go out of blast, only those favorably located being able to run. We quote for cash, cars, Louisville:

Southern Coke, No. 1 Foundry...	\$13.00 @	\$13.25
Southern Coke, No. 2 Foundry...	12.00 @	12.25
Southern Coke, No. 3 Foundry...	11.00 @	11.25
Southern Coke, Gray Forge...	10.75 @	11.00
Southern Charcoal, No. 1 Foundry...	15.00 @	16.00
Southern Car Wheel...	17.50 @	17.75

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 50 Dearborn street, CHICAGO, March 8, 1893.

The business interests of Chicago are now confronted with a possible serious disturbance in the shape of a strike of all the switchmen on the railroads centering here. The situation is regarded as very grave, because the railroad managers insist that they are not able to comply with the switchmen's demands for considerably higher wages. If the strike really takes place it promises to be the most serious with which the railroads have yet had to contend. Merchants and managers advise their customers to order goods promptly so as to get them out before railroad operations are completely suspended.

Pig Iron.—A very fair movement has taken place in local Coke Iron, but not so large as in the previous week. Plenty of business is reported to be still in sight. Buyers are coming in who were not expected to make their appearance at this time of the year. The disposition to purchase for long deliveries is still prominent and recent contracts have been made which cover shipments for the whole of this year. The consumption is unexpectedly active, as very heavy shipments are going forward now. All branches of the foundry trade are participating in the demand, which is better than was known at the same time last year. The Architectural Iron workers report their trade more promising than for a long time, as they are now able to compete with the steel manufacturers in making prices on Column work. Good contracts have been placed lately for Southern Coke Iron, but in almost every case at prices below our recent quotations. Representatives of strong Southern companies claim to be getting more for their iron than small manufacturers, as consumers are somewhat apprehensive that they will not be able to get full deliveries from the latter on contracts covering shipments extending well into the future. Rumors are current of prices made for Southern Iron during the past day or two at lower rates than anything previously known in this market. Lake Superior Charcoal is still quiet. We revise our quotations as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal...	\$16.50 @	\$17.00
Local Coke Foundry, No. 1...	13.25 @	13.75
Local Coke Foundry, No. 2...	13.00 @	13.25
Local Coke Foundry, No. 3...	12.75 @	13.00
Local Scotch...	14.00 @	15.00
Ohio Strong Softeners...	16.00 @	16.50
Southern Coke, No. 2...	13.25 @	13.50
Southern Coke, No. 3...	12.75 @	13.00
Southern, No. 1, Soft...	13.25 @	13.50
Southern, No. 2, Soft...	12.75 @	13.00
Southern Gray Forge...	12.60 @	12.90
Southern Mottled...	12.60 @	12.75
Tennessee Charcoal, No. 1...	16.50 @	17.50
Alabama Car Wheel...	18.35 @	19.85
Coke Bessemer...	14.50 @	15.00
Hocking Valley, No. 1...	16.75 @	17.00
Jackson County Silvery...	16.75 @	17.00

Bars.—Inquiries for Bar Iron are improving, both in volume and the qualities called for. The situation in this branch of trade is rather better than in others. A good indication of improvement is seen in

the efforts of brokers to place contracts for orders which they have taken at current rates, even if they have to sacrifice their commission. They find very few mills now in a position to give them advantage, which were decidedly numerous only three weeks since. The current rate on Bar Iron is about 1.57½¢, Chicago, with half extras. Soft Steel Bars are in good inquiry, with very fair sales at 1.65¢, Chicago, upward. Railroads are now taking Soft Steel for both new cars and for repairs. Store prices are unchanged at 1.70¢ @ 1.80¢ for Bar Iron, and 1.80¢ @ 1.90¢ for Soft Steel.

Structural Material.—More business is doing, but transactions are not large. They are increasing in number, the demand being excellent from bridge works and from the small builders. Large building contracts are still held in abeyance until the price of Beams is more definitely settled. Quotations on mill orders, Chicago delivery, are as follows: Beams 2¢ @ 2.10¢; Angles and Universal Plates, 1.85¢ @ 1.95¢. Angles are now being sold from store at 2¢ @ 2.10¢, which is the lowest price at which they were ever sold here in a small way.

Plates.—The demand is only moderate, both from mill and stock. Orders of any size are sharply competed for, to the evident extinction of profit for manufacturers. This is shown by the withdrawal from the field of some of the Eastern Plate mills, which have hitherto been eager competitors for anything in sight. The Tube market is in a demoralized state. The nominal quotation on Boiler Tubes remains 65 % off, but concessions are made according to the character of the order. Quotations on mill shipment, Chicago delivery, are as follows, for carload lots: Tank Steel, 1.90¢ @ 2¢; Sheet Steel, 2.10¢ @ 2.15¢; Flange Steel, 2.27¢ @ 2.30¢; Ordinary Fire Box, 3.50¢. Store prices continue as follows: Nos. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.25¢ @ 2.40¢; Shell, 2.40¢ @ 2.60¢; Flange Steel, 2.70¢ @ 2.90¢.

Sheets.—Large inquiries are in the market for Light Sheets from jobbers. The regular price for Black Sheets, mill shipment, is 2.85¢ @ 2.90¢, Chicago, for No. 27 Common, but on these large contracts lower prices are very likely to be made, as the business is desirable and shipments will extend over the summer months. Sheet Steel is quoted at 10¢ @ 15¢ per hundred over the price of Iron, but some manufacturers are reported to be making the margin a little closer. Stocks of Galvanized Iron have gone off rapidly from warehouses here with the advent of pleasant weather, enabling outdoor work to be more actively prosecuted. Prices for mill shipment are about 70 and 10 % discount on Juniata and 70 and 5 % for small lots from stock. Sheet Copper is steady at 30 % off from stock.

Merchant Steel.—Very little is to be reported under this head in the way of transactions. The business is confined to pick-up lots from manufacturers who need more than they are receiving under old contracts. Open-Hearth Machinery and Spring Steel are still quoted at 2¢ @ 2.20¢, Chicago, for mill shipment by standard manufacturers. Bessemer Tire Steel is now offered at 1.67½¢, Chicago, for mill shipment, with Bar Iron extras. Ordinary Tool Steel is unchanged at 6¢ @ 7¢, according to quality, and special at 12¢ and upward, according to make.

Billets.—Manufacturers continue to quote \$25, Chicago, for March and April delivery. Inquiries are in the market for considerable quantities, but local manufacturers refuse to take any large orders, which are consequently going to works further East.

Rails and Track Supplies.—Standard sections of Steel Rails are firm at \$30 @ \$32, according to quantity. Not much business has been done the past week, but manufacturers report prospects excellent for more business early in the future. Iron and Steel Splice Bars are still quoted at 1.65¢ @ 1.70¢. Track Bolts with Hexagon Nuts 2.60¢ @ 2.65¢, Spikes 2¢ @ 2.05¢.

Old Rails and Car Wheels.—Dealers are now offering \$18 while holders are asking \$18.50 for Old Iron Rails. Transactions have been very light since our last report. Old Steel Rails are quoted by dealers at old prices, namely, \$11.50 for short pieces and \$14.50 @ \$15 for long lengths. Old Car Wheels are firmer. Transactions have occurred within the range of \$14.75 @ \$15.

Scrap.—Sales of Heavy Railroad Scrap are noted at \$16 for forge purposes. Other material has changed hands in small quantities only. Dealers quote as follows per net ton: No. 1 Forge, \$15; No. 1 Mill, \$11; Sheet Iron, \$6; Pipes and Flues, \$10; Axles, \$20; Horseshoes, \$15.50; Fish Plates, \$16.50. Spikes and Bolts, \$14.50; Cast Borings, \$5.50; Wrought Turnings, \$8; Axle Turnings, \$9.50; Heavy Cast, \$11.25; Stove Plate, \$8.50 @ \$9; Malleable Cast, \$9; Mixed Steel, \$10 @ \$10.50, gross ton; Leaf Steel, \$17.75.

Metals.—Lake Copper is unchanged at 12½¢, but Casting brands are a shade weaker, and are now selling at 11½¢ in carload lots. Pig Lead is quiet, with 3.70¢ bid and 3.72¢ asked. Spelter is nominally quoted at 4.10¢.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, March 8, 1893.

There has been a fairly satisfactory volume of distribution of Pig Iron during the week, although it was mainly in small lots, there being no disposition on the part of buyers to contract for large quantities for forward delivery; the largest sale made being 3500 tons for March, April, May and June delivery on the basis of prices current for spot delivery, and in almost every instance the sales have been made at the inside quotations. During the last few days there has been a more active inquiry for Pig in anticipation of the wants of consumers, which may result in a large volume of business. Iron is cheap enough; prices are as low as it is reasonable to expect them to be, but at the moment there appears to be no advantage in buying far in advance of current consumption. There have recently been liberal purchases of Soft Southern Iron, which is wanted for mixing with the harder Northern Irons, and No. 1 and No. 2 Soft Foundry Coke Irons have been pretty well sold up and they are becoming scarce. There have been some sales of Lake Superior Charcoal Iron during the week, but nothing has developed to indicate any change in price. Some of the Southern furnaces sold more iron than they produced during the month of February and consequently reduced their stocks, and the indications are that this was the general experience. The feeling in the trade is rather better than a week ago, but there is no change to be made in quotations.

Foundry.

Southern Coke, No. 1...	\$13.25 @	\$13.50
Southern Coke, No. 2...	12.00 @	12.25
Southern Coke, No. 3...	11.25 @	11.50
Ohio Soft Stone Coal, No. 1...	16.00 @	16.25
Ohio Soft Stone Coal, No. 2...	15.00 @	15.25
Mahoning and Shenango Valley...	14.75 @	15.00
Hanging Rock Charcoal, No. 1...	19.00 @	19.25
Hanging Rock Charcoal, No. 2...	18.00 @	18.50
Tennessee and Alabama Charcoal, No. 1...	15.50 @	15.75
Tennessee and Alabama Charcoal, No. 2...	14.50 @	14.75

Forge.		
Gray Forge	11.00 @	11.25
Mottled Neutral Coke.....	10.75 @	11.00
Car Wheel and Malleable Irons.		
Standard Southern Car Wheel.....	18.00 @	19.00
Lake Superior Car Wheel and Malleable.....	17.75 @	18.00

Boston.

Office of *The Iron Age*, 146 Franklin St.,
BOSTON, March 8, 1893.

Pig Iron.—The slightly better demand for Pig Iron is continued. It requires a heavy volume of Iron to supply the New England foundry people, busy as they are to-day, and they have given orders of late for Iron to arrive. It cannot be learned that these transactions have been at any easier prices. The principal dealers, in fact, say that Iron is not to go any lower. They also explain that even 50¢ a ton off from the present low prices would stop production. Southern Iron is steadily quoted at: No. 1, \$15.50 @ \$16; No. 2, \$14.50 @ \$15; No. 3, \$14 @ \$14.50. Virginia Iron, which is very largely used in this market, is quoted at about 50¢ per ton above the above prices for Alabama Iron, the quotations on each meaning Iron delivered in Boston. Pennsylvania Iron is also in slightly improved request, but competition with Southern Iron is very keenly felt. The quotations on this class of Iron at shipping port are at: No. 1, \$15 @ \$15.50; No. 2, \$14 @ \$14.50; Gray Forge, \$13.50. Other Western Irons are unchanged in prices at \$17.75 @ \$19 for Iron delivered in Boston.

Bar Iron.—There is a good demand for Bar Iron and Bar Steel, which is now pretty generally furnished where iron is not specially specified. The demand from machinists and manufacturers is good, but at the same time values are not very firm. Quotations are retained, however, at: Ordinary Bars from mill, 1.60¢ @ 1.65¢; from store, 1.65¢ @ 1.70¢. The best known Bars from Puddled Iron are quoted at 1.85¢ @ 1.95¢ from mill; from store, 2.10¢ @ 2.25¢. Norway and Swedish Bars and Shapes are unsettled in the market for round lots to be imported, with importers not pleased at the situation. From store here the market is quoted at \$65.50 @ \$67.50 for Bars and Shapes.

Steel and Steel Plates.—There is a good business in Steel so far as the machinists are concerned. They are busy and they buy liberally, but the offerings are also liberal, and this causes prices to be easy. Some good contracts are being placed by prominent machine concerns, and they are liberal buyers of Soft and Cast Steels. The Mason Machine Works of Taunton, Mass., has secured contracts for some 60,000 spindles in cotton machinery, and other machine shops engaged in building textile machinery are about equally busy. The quotations on Steel are easy at: Bessemer Steel, 2.10¢ @ 2.20¢; Machinery, 2.05¢ @ 2.20¢; Tire and Sleigh Shoe, 2¢ @ 2.10¢; American Cast, 7¢ @ 7½¢; English Cast, 13¢ @ 15¢; American Steel Rails, \$29 at mill. There is a moderate business in Steel Plates, with the market easy. Quotations favor the buyer at: Tank, 1.90¢ @ 2¢; Shell, 2¢ @ 2.10¢; Flange, 2.30¢ @ 2.35¢; Fire Box, 2.65¢ @ 3½¢.

Structural Iron continues in good request, with deliveries being made in better order and in better time than a week ago. Still there is considerable delay to transportation. Builders, with the continuance of the milder weather, will be very busy. Contracts for Iron continue to be placed, but competition among manufacturers is so brisk that buyers continue to get concessions. Quotations are nominally retained, however, at: Beams and Channels, 2.10¢ @ 2.20¢ from mill; from store, 2½¢ @ 3¢; Angles, 2¢ @ 2.10¢

from mill; 2½¢ @ 2½¢ from store; Tees, 2.40¢ @ 2½¢ from mill; 2½¢ @ 2½¢ from store.

Pipes and Tubes.—There is only a quiet trade in Pipe, with values unchanged in quotation, though customers are favored on large lots. Contracts for water works are being hindered by the great volume of snow that covers the whole of New England. Boiler Tubes are steady at 65 % off from price list on all sizes.

Scrap.—Old Iron is very dull, yet the great body of snow on the ground has checked offerings. For No. 1 Wrought Scrap 50¢ @ 100 is a full quotation for ordinary lots, though particular lengths and sizes of the best quality would bring 60¢. Old Horseshoes are quoted at 60¢.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, March 8, 1893.

Pig Iron.—Transactions during the past week were, generally speaking, limited to carload orders with an occasional order varying from 50 to 100 tons. Offerings continue to exceed the consumptive demand, however, and prices are weak and unsettled. Gray Forge and No. 2 Foundry are apparently the weakest Irons in the entire list, the latter selling on the basis of \$9.25 and Gray Forge at \$8.25, f.o.b. Birmingham. The competition for business among the agents continues and consumers are buying only as their needs require and find prices lower with each additional purchase. The immediate outlook does not contain anything of an encouraging character, and with only a limited demand prices are not likely to improve very soon. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry, \$13.75 @ \$14.25	
Southern Coke, No. 2 Foundry, 12.50 @ 12.75	
Southern Coke, No. 3 Foundry, 12.00 @ 12.25	
Southern Gray Forge..... 11.50 @ 11.75	
Southern Car Wheel..... 18.25 @ 19.00	
Lake Superior Car Wheel..... 17.00 @ 17.50	
Ohio Softeners 16.25 @ 17.00	
Missouri Charcoal, No. 1 Foundry..... 13.50 @ 14.00	

Bar Iron.—The market is dull and unchanged, notwithstanding the fact that prices are already lower than it was thought possible for them to go. Additional concessions are asked for, and, in some cases, allowed. There is plenty of work in sight among the car builders and other large users of Bar Iron, but they do not appear to anticipate their wants too far ahead. Mills quote from 1.57½¢ to 1.60¢, and the lowest price mentioned is occasionally shaded for desirable specifications.

Barb Wire.—The demand is exceedingly heavy and prices are firmly adhered to. Jobbers are complaining about the slowness with which their orders are being filled, but mills say they are unable to do any better. With a large spring trade in sight and assured, and this condition of affairs at present existing, it looks very favorable for high prices. At the moment we quote Painted in carload lots to jobbers \$2.20; Galvanized, \$2.60.

Wire Nails.—The remarks concerning Barb Wire apply also to Wire Nails; the demand is heavy and prices are strong. The recent advance East has helped the market generally, and although the local mills continue to quote carload lots at \$1.70 rate, they are looking for an early advance. Large jobbers have bought heavily, and a slight advance in the near future seems quite probable.

Pig Lead.—The market for Pig Lead is fairly active, several hundred tons changing hands at 3.65¢. Some brokers ask 3.70¢, but consumers appear to have

no difficulty in placing their orders at the former price. The New York market is higher, and may influence prices here somewhat.

Spelter.—This metal seems to be entirely void of recuperative qualities and sales continue to be made at 3.95¢. It is intimated that this price has been shaded, but the above is a fair market price for moderate quantities. Freight rates same as last reported.

The MacMurray-Judge Architectural Iron Company, St. Louis, made an assignment Monday, the 6th inst. Liabilities \$140,000. Assets unknown. M. W. Warren, Bank of Commerce Building, St. Louis, Mo., had bought all interest of W. H. Brown & Sons in St. Louis in the Coal and Coke business, and from this date the firm name is changed to M. W. Warren. This, however, will be the only change, as Mr. Warren will draw all supplies from the same sources as heretofore. In a circular issued by Mr. Warren he asks for a continuance of past favors and guarantees prompt attention to all orders intrusted to his care.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, March 7, 1893.

The first week in March finds the business situation more satisfactory than at any time during the two months of the year just closed. Of course there has not been much improvement in prices as yet, but there has been some, and in view of the heavy demand being experienced for some lines of both Finished and Raw Material, it is more than probable that higher prices will prevail on some articles before very long. This applies particularly to Wire Nails and Wire, the demand for both at this time being extremely heavy. This activity is being felt in the Steel market, and Steel for early delivery is in good demand and at satisfactory prices. A heavy increase in orders for Structural Shapes is reported, and makers confidently expect a very busy season. Railroads are commencing to place orders for both car and track equipment, and this will have a favorable effect on business of all kinds. Perhaps the worst feature in connection with the Iron and Steel trades to-day is the difficulty in making prompt collections. Much complaint on this score was heard last month, but with the opening up of spring trade and more favorable weather, we will, no doubt, have an easier money market.

Bars.—The situation is about as reported last week. While there has been a material improvement in business and prospects for the future are exceedingly encouraging, there continues to be more or less cutting in prices by mills whose desire seems to be to capture all the business they possible can, and are willing to make concessions in order to get it. The two trunk lines entering this city, the Pennsylvania Railroad and Baltimore & Ohio Railroad, have already made large purchases in the market and are expected to place additional contracts from this time on for the extension of their equipment. We quote No. 1 Bars at 1.55¢ @ 1.60¢, and Steel Bars at 1.60¢ @ 1.65¢. These prices are occasionally shaded on desirable lots. Bars in the Valley are held at 1.45¢ @ 1.50¢, half extras, with the first named as the ruling price.

Ferromanganese.—The market is reported firm at \$59, f.o.b. cars Pittsburgh, and we are advised of a sale of 100 tons at that price.

Steel Rails.—A fairly large volume of business is reported. The Toledo &

Ohio Central is said to be in the market for about 3000 tons. Edgar Thomson continues on Rails and prices are without change on a basis of \$29, Pittsburgh, for standard sections.

Structural Material.—The increased volume of business noted in our last report continues, and the outlook for the future as far as demand is concerned is very good. Within the last week the Carnegie concern are reported as having taken contracts for the Steel work for the new Spitzer Building in Toledo, amounting to 1500 tons. Several good sized contracts are in the market and will probably be closed within the next week or ten days. The increased demand has caused a firmer tendency in prices, and there are those who believe that a slight advance in the near future is not improbable. We continue quotations of last week, as follows: Beams and Channels, 1.80¢ @ 1.90¢, f.o.b. Pittsburgh; Angles, 1.70¢ @ 1.75¢; Z Bars, 1.90¢; Tees, 3¢ @ 2.10¢.

Muck Bars.—Very little is doing and price remains at \$24.25, Pittsburgh, for best grade of Muck Bars, but it is intimated that this price has been shaded recently in several instances.

Plates.—A good tonnage is moving, although prices on several contracts recently placed are said to have been lower than have yet been named. Although the outlook for demand for this class of material is reported as very good, the impression seems to be general that owing to severe competition prices will continue to rule largely in favor of buyer. For large lots prices quoted below would, no doubt, be shaded to some extent. For ordinary lots we quote as follows: Ordinary Fire Box, 2.40¢ @ 2.75¢; Best Quality, 3¢ @ 3.25¢; Flange, 2¢ @ 2.10¢; Tank, 1.65¢ @ 1.70¢; Shell, 1.85¢ @ 1.95¢; Universal Bridge Plates, 1.70¢ @ 1.75¢.

Wire and Cut Nails.—Not for months has the demand for Wire Nails been as active as it is at the present time, and in some cases mills are refusing to quote for extended delivery at present ruling prices. Not only does the large demand come from the larger buyers, but smaller concerns who heretofore confined their purchases to 25 and 50 keg lots are now buying in carload lots. Prices established at the meeting held in Cleveland several weeks ago are being firmly maintained, and offers of large blocks at prices slightly lower than have been agreed upon have been refused by the mills in every instance. It is the general impression that the consumption of Wire Nails during 1893 will be much heavier than in any previous year in the history of the trade. We continue to quote Wire Nails on the basis of \$1.45, f.o.b. cars Pittsburgh, and \$1.50, Cleveland, in carload lots, and it is intimated that a slight advance in the near future is not improbable. A material improvement in the Cut-Nail market is reported, and much of it is claimed to be due to the new card adopted in Pittsburgh early in February. As near as can be learned, mills are rigidly observing this card in making quotations and it is believed that it is entirely satisfactory to both maker and buyer. We quote Cut Nails at \$1.25 base, with usual extras.

Pipes and Tubes.—A very fair demand is going for Merchant Pipe and while the larger sizes have been dull for some time past, a slight improvement in inquiries during the past week is reported. Boiler Tubes are also in good demand, and a fair tonnage is moving. Prices, however, continue somewhat demoralized, with very little prospect of immediate improvement. On Monday, March 6, notices were posted in the Youngstown, Ohio, and Middletown, Pa., mills of the American Tube &

Iron Company, announcing a reduction of 10% in wages to go into effect on Monday, March 20.

Wire.—As in the case with Wire Nails, a very heavy demand for all kinds of Wire is reported, and mills have probably never been more fully employed than they are at this time. This demand comes from jobbers and consumers alike, and the indications are that it will continue for some time. Several mills are reported as having all the business booked that they can take care of for some time, and have recently been compelled to refuse desirable contracts. This large increase in demand has not been without its effect on prices, which have already advanced slightly, and are in a fair way to go still higher. We quote Painted Barb Wire at \$2.05 @ \$2.10, and Galvanized at \$2.45 @ \$2.50, both in carload lots, f.o.b. cars Pittsburgh.

Sheets.—There continues to be a disposition among makers to refuse to book contracts for delivery later than July 1, for fear that labor troubles may possibly occur. For this reason the demand for Sheets for shipment within the next three months is very heavy, and prices are being firmly maintained. We quote Box Annealed Sheets as follows: No. 24, 2.50¢; No. 26, 2.60¢ and No. 27, 2.70¢. For Soft Steel Sheets the usual advance is obtained. Galvanized Sheets are also in good demand, but as in the case with Black Sheets, manufacturers are not disposed to enter contracts for delivery later than July 1. Prices are reported as firm, and discounts are ranging from 70 and 5% to 70 and 10%, according to size of order.

Merchant Steel.—Demand is very quiet, and there continues to be considerable irregularity in prices. Plow Steel is in better demand, and prices are being more closely observed than is the case with the other kinds. We quote Plow Steel at 1.95¢ @ 2¢, and Tool Steel from 6¢ upward, according to grade.

Wire Rods.—There is nothing new to report, there being no improvement in demand and consequently no change in prices. We continue to quote at \$29.50, Pittsburgh.

Connellsville Coke.—For the week ending February 25, 12,820 ovens in the Connellsville region were in blast, and 4500 idle, the total production for the week being estimated at 121,434 tons. Prices on Furnace Coke continue somewhat irregular and we quote at \$1.50 @ \$1.60 in tons of 2000 lb, f.o.b. cars in Connellsville region.

Freights.—The joint freight committee of Pittsburgh, Wheeling, Youngstown and Cleveland met in Pittsburgh last week for the purpose of talking over the question of the Iron rates for the coming season.

There was no definite action on rates taken, but recommendations were prepared for presentation to the Central Traffic Association at its meeting in Chicago on the 14th inst. The manufacturers have been protesting against the high rating of certain classes of Manufactured Iron and also as to the rating and classification of material put in the same class as Billets. The matter will be acted upon by the association and will affect rates both East and West.

Between Pittsburgh and	Group 1. Per ton.	Group 2. Per ton.
Mahoning Valley, Shenango		
Valley & Wheeling, W. Va.	\$0.60	\$0.75
Steubenville, Ohio.....	.50	.65
McKeesport, Pa.....	.30	.30
Braddock, Pa.....	.30	.35
Dunbar, Pa.....	.60	.75
Kittanning, Pa.....	.50	.55
Johnstown, Pa.....	.75	.80

From Pittsburgh, Beaver Falls, Homestead, Rankin, Braddock and McKeesport to	Group 1.	Group 2.
Albany, N. Y.....	\$2.30	\$2.60
Baltimore, Md.....	1.70	2.00
Boston, Mass.....	2.70	3.00
Buffalo, N. Y.....	1.25	1.25
Findlay, Ohio.....	1.75	1.75
New York City, N. Y.....	2.30	2.80
Oswego, N. Y.....	2.30	2.80
Philadelphia, Pa.....	1.90	2.20
Rochester, N. Y.....	1.80	2.00
Syracuse, N. Y.....	2.30	2.60
Utica, N. Y.....	2.30	2.60

Rates shown under head of Group 1 will apply on Pig Iron, Mill Cinder and Scale, per gross ton, in carloads of 12 gross tons and over.

Rates shown under head of Group 2 will apply on Billets (Iron or Steel), Blooms (Iron or Steel), Borings (Iron or Steel), Chain Irons (in coils), Crop Ends (Iron or Steel), Ingots (Iron or Steel), Muck or Puddle Bars, Old Car Wheels and Axles, Old Rails, Scrap Iron, Scrap Steel, Scrap Tin, Slabs, unfinished (Iron or Steel), and Wire Rods (in coils), per gross ton, and on Ingot Molds and Cast-Iron Pipe per net ton, in carloads of 12 tons, net or gross, and over.

(By Telegraph.)

Pig Iron.—The market is in about the same condition as noted in our report of last week. On the part of furnaces, there is not much pressure to sell Iron, and, on the other hand, buyers are not disposed to anticipate their wants to any considerable extent. It is evident that the subject of Ore contracts is engrossing the attention of the trade at this time, and it is the impression that there will be no very decided buying movement until there has been some business done in this direction. As far as prices are concerned, it can be said they are steady, but there are no indications of an advance in the near future. There is an increased movement in Gray Forge, and the price is being firmly maintained on a basis of \$12.25, Pittsburgh. Foundry Iron is also in increased demand at unchanged prices. We quote as follows:

Neutral Gray, Forge.....	\$12.25 @ cash.
Δ-Ore Mill.....	12.50 @
No. 1 Foundry.....	13.75 @	\$14.00 "
No. 2 Foundry.....	12.75 @	13.00 "
Charcoal Foundry No. 1.....	17.00 @	18.00 "
Charcoal Foundry No. 2.....	16.50 @	17.00 "
Bessemer Pig.....	13.35 @	13.50 "

We note sales as follows: Five thousand tons of Bessemer for March and April, \$13.40, Pittsburgh; 1500 tons for same delivery at \$13.50, Pittsburgh, and 2500 tons for March, April and May at \$13.45, Pittsburgh. We also note sales of Gray Forge aggregating 3500 tons at \$12.25, Pittsburgh.

Billets.—The favorable opening up of spring trade, coupled with the fact that mills in the Pittsburgh and Wheeling districts are sold up for the next 60 days, has caused a decided scarcity of Steel for March and April delivery, and prices are firm and higher. Offers made by Cleveland to buy for the second quarter of the year at \$23, Cleveland, equal to \$21.75 Pittsburgh or Wheeling, were declined last week by makers in both places. Negotiations for a block of 5000 tons for April, May and June are now pending, and the deal will probably be closed this week at a price equal to \$22 at makers' works. Steel for March and April has

been sold within the last week at prices ranging from \$22.15 to \$22.50, the last-named price being obtained for 500 tons for March delivery. The outlook is decidedly favorable for present prices being sustained, and still higher prices before long are probable.

Detroit.

DETROIT, MICH., March 6, 1893.

A large inquiry was seen during the past week for Coke Iron, mostly, too, for Northern grades. Some few transactions, one in particular, aggregating a large tonnage, were placed. There is nothing new whatever in the price of Coke Iron. The market continues to be a buyers' one, and with the exceptions as we have noted above, there is no general buying movement for this class of metal.

Several large deals were consummated for Lake Superior Charcoal Pig, which seems to be the most interesting feature in the market altogether. One buyer closed for a lot of 4000 tons, delivered over the next three months. This was in the West. In the East, a steady inquiry for Iron is seen. Some is for prompt delivery by all rail, while other buyers realize that the early bird will probably get the best of it this time, and are endeavoring to make purchases for delivery after the opening of navigation. It would seem very foolhardy for Lake Superior furnacemen not to take advantage of the present short supply, and refuse to sell for such delivery except at a good advance. There can be no doubt of a satisfactory business in Lake Superior Charcoal Iron this year.

We quote the market as follows:

Lake Superior Charcoal, all numbers.....	\$16.50 @ \$17.00
Lake Superior Coke, Bessemer.....	15.00 @ 15.50
Lake Superior Coke, Foundry, all ore.....	15.50 @ 16.00
Standard Ohio Blackband (40 per cent.).....	15.50 @ 16.00
Southern No. 1.....	14.00 @ 14.50
Southern Gray Forge.....	12.50 @ 13.00
Jackson County (Ohio) Silvery.....	17.25 @ 17.75

Financial.

Now that a new administration is at the helm of public affairs, the financial necessities of the Treasury at once engage attention, as the foreign demand for gold continues, also the issue of notes in purchase of silver bullion, and special provision for the future becomes a peremptory need. The President's inaugural, while recognizing this fact, contains no intimation of the measures of relief to be adopted. It is understood, however, that negotiations are pending with a London firm which provide for a liberal supply of gold in exchange for bonds. Receipts for customs duties being at the present time less than 6% in gold certificates as compared with more than 80% two or three years ago, that source of supply can no longer be depended on. The probability of an extra session of Congress to consider the silver question is a subject of discussion, without any decided bias of opinion. For the first time during the current fiscal year the revenues of the Government show a slight decline as compared with a year ago. The receipts for February from all sources are reported as \$30,009,000, compared with \$30,755,000 for February, 1892. The national bank note circulation increased during February \$1,032,235, making the total circulation of this class of money \$175,320,356 on March 1.

The stock market was less active, showing the effects of the extreme depression that has overtaken several specialties since the break in Reading, which touched the lowest point since 1891, while Lehigh Valley declined from 121 to 93. The general disposition was to await events at

Washington. On Monday the market opened strong, influenced by better prices in London, but immediately after news of the engagement of \$2,300,000 gold for export to Europe caused a fall, and the weakest stocks were Sugar, Whiskey, Cordage, Cotton Oil, Reading, the grangers and New England. The pressure was greatest upon the latter. The market was then affected by a demand for money at 30% and also by the fact that the net gold in the Treasury is down to \$103,000,000, the lowest point yet reached. Attention was also called to the fact that the banks have, as a rule, a very low reserve, a few carrying the whole of the surplus. Exchange fell off by reason of active money, though at comparatively moderate rates. New England was affected by a report that a large block of this stock, held as collateral on a loan, was being liquidated. Fears of tight money were reflected in large sales of cash stock, and Cleveland's allusion to trusts caused a decline of the leading industrials.

Money has been much firmer, influenced by the announcement of intended specie shipments and by the withdrawal of funds by Western banks. The bank statement, as was expected, showed a heavy loss in legal tenders in consequence of the outflow of currency to the interior. The decrease in cash was \$5,557,600, and as the loans were contracted to about the same extent, the liquidation in deposit liabilities amounts to \$10,703,800. The banks now hold \$6,503,125 in excess of the 25% legal requirement, against \$21,292,225 a year ago and \$10,880,975 in 1891. As the week closed the loan market was very strong, influenced by the poor bank statement and continued shipments of currency to the interior. Time loans were in active request at 6%, and borrowers discriminated carefully in the acceptance of collateral. Commercial paper was very slow, and practically without a market. In Boston money loaned as high as 10% exciting severe criticism against the banks, but in Philadelphia money was quoted 5½% @ 6%. The Chicago market at the end of February was on a parity with New York. United States bonds were quoted as follows:

U. S. 4½s, 1891, extended.....	99½
U. S. 4s, 1907, registered.....	111½
U. S. 4s, 1907, coupon.....	112½
U. S. currency 6s.	107½

In the merchandise markets, outside of speculative circles, prices varied but slightly. The weather conditions, however, were unfavorable to the movement in goods. The wheat market was dominated by crop reports. Prime says there is every indication of an early spring. Winter wheat is beginning to grow in Texas and it is in the finest condition in years. In Kansas the frost is out of the ground and wheat is beginning to grow. Early sown, however, looks best. In Illinois damage is reported, but it is too early to say to what extent. In Michigan and Wisconsin conditions are very favorable. Spring seeding has commenced in Nebraska. Spot cotton closed easy at 9½¢ for middling uplands. Hog products were a little stronger on reduced stocks and a decrease of 3,000,000 in the season's packing compared with last year. Coffee dull and lower. Wool firm. Rubber without buoyancy.

A Paris dispatch makes the "war reserve" hoarded in the treasure vaults of Europe as follows: Germany, \$300,000,000; France, \$400,000,000; Russia, \$425,000,000; Austria, \$150,000,000; Italy, \$50,000,000. Total, \$1,325,000,000, practically withdrawn from the uses of trade.

The Berlin Iron Bridge Company of East Berlin, Conn., have appointed William H. Riley as purchasing agent, with headquarters at the Colonnade Hotel, at Phila-

delphia, Pa. Mr. Riley will hereafter have charge of purchasing all material for the Berlin Iron Bridge Company, and all correspondence in connection with this matter should be addressed to him at the Colonnade Hotel, Philadelphia, Pa.

Coal Market.

The Anthracite Coal market is steady under a steady demand and is supposed to be unaffected by the disintegration of the combine. The situation, it is claimed, is altogether normal, being governed by the law of supply and demand. No sales are heard of below the old combine schedule, though there has been some talk about cutting. All sizes are plenty, except Pea and Buckwheat, which are scarce, as usual whenever transportation is active. This is explained by the fact that freight charges on these sizes are 25¢ and 40¢ respectively less from the mines to tidewater than the prepared sizes and therefore the latter have a precedence on the railroads. Besides it is not unusual for the small Coal to become congealed in the cars, making it necessary to mine a second time in unloading. Pea, f.o.b., is \$2.75 @ \$2.85; Buckwheat, \$2 @ \$2.15. Production for the week, 516,500 tons, a decrease of 215,000 compared with the same week last year, and for the year the decrease is 85,500 tons.

The strike of the Susquehanna Coal Company's miners, at Nanticoke, Pa., has terminated, the men accepting the company's offer of the wage scale of the Delaware, Lackawanna & Western collieries.

A dispatch from Halifax says that another syndicate has acquired options on the remaining Coal fields of Cape Breton Island not acquired by the Whitney syndicate. The options include one of the most valuable mines in Eastern Canada.

The Coal production of the Delaware & Hudson Canal Company for 1892 amounted to 4,396,852 tons.

Bituminous Coal is in short supply and prices are firm.

Metal Market.

Pig Tin.—Between a blunder of the Washington representative of the United Press regarding the fate of the bill to prevent the duty prescribed in the McKinley tariff law going into effect on July 1, and effective manipulation of prices by some prominent operators upon evidence that there really had been a serious mistake on the part of the news gatherers, the market has been enlivened considerably. When the announcement was made that the bill to abrogate the proposed duty had become a law prices drooped wearily, and there were apparent anxious sellers at 20½¢ @ 21¢ for any delivery up to and including July. Immediately upon the circulation of rumors, well supported, that the report was erroneous the complexion of affairs underwent a decided change. Instead of sellers at the price named, buyers at 20½¢ came prominently to the front, but Tin did not. Subsequently the bull interest made the most of every circumstance in their favor and raised quotations to 20.80¢ @ 20.90¢, without actually buying enough Tin to inspire outside confidence in the apparent strength of the market. After the advance was established some few trades were put through, but the greater portion of the transactions were between a few operators who have everything to gain and nothing to lose by keeping quotations high. It is no secret that spot stocks are heavy, including a considerable "invisible" supply, and that about 2000 tons are due here this month. Some authorities state also that consumers are well stocked and un-

likely to figure as heavy or anxious buyers in the immediate future, leaving the task of maintaining prices chiefly upon the shoulders of the leading speculators. The short interest on this side of the Atlantic is comparatively small, but the reverse is believed to be the case in London. On Wednesday prices were pushed still higher, March delivery having realized 21.10¢ @ 21.15¢, while the latter was bid for April, and 21.20¢ for May and June delivery.

Copper.—No large dealings or anything more than very commonplace run of orders are reported here as yet, but the statement comes from a reliable source that the spot supply of C. & H. brand has been worked down so closely that it was necessary to make some overland shipments to the works in order to fill contracts, and a few of the smaller producers, it is also learned, are almost bare of spot stock. In the face of late apparent inability to move lots from second hands, except at prices about 10¢ @ 15¢ @ 100 lb below the producers' lowest quotations, these statements arouse comment and lead to insinuations that, while stiff prices are now quoted on spot stock, there is variety in the quotations for Copper for shipment after the opening of navigation, with the level somewhat lower, and that resumption of work at the Anaconda establishment will bring about a radical change in the not far distant future. Whatever the facts in this connection may be, there is hardly a doubt that no considerable quantities are available just now at less than 12¢ for Lake Superior Ingot and 11¢ for common casting brands.

Pig Lead.—During the early portion of the week under review about 300 tons Common were sold at 3.85¢, near future delivery. Subsequently single carloads realized 3½¢ @ 3.90¢ and toward the close the latter price was paid for larger lots to the extent of about 150 tons all told. At this writing the demand is rather slow, but reserved offering serves to impart some firmness to the market, temporarily at least.

Spelter.—Fair quantities of Western have been sold at 4½¢, delivered in Pittsburgh, and some business for Eastern account was put through early in the week at 4.22½¢ @ 4½¢, delivered for May and later shipment. Reported reduction in supply and consequent higher cost of ores have, however, operated to modify the selling pressure sufficiently to enable the market to gain rather better tone the past few days. For the present, 4.27½¢ is named as being a close price for round lots, future shipments, while 4.30¢ is generally asked. Spot parcels are held at about the usual premium.

Antimony.—Business has been moderate, but owing to tardiness of arrivals of some brands prices have ruled irregular. Current quotations are 10½¢ @ 10½¢ for Hallett's, 10½¢ @ 10½¢ for LX and 10½¢ @ 10½¢ for Cookson's.

Tin Plate.—Fair orders, chiefly for lots of 500 to 1500 boxes of Cokes per month for delivery between May and August, have been placed, but interest in futures is still rather tame, there being no special incentive for anticipating future wants to any unusual extent. Spot business has continued on strictly conservative lines, and of barely fair average volume for the season. Prices remain almost stationary, and the market is steady although quiet. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, scarce; light weights, \$5.10 for 100 lb, \$4.95 @ \$5.00 for 95 lb, \$4.85 @ \$4.90 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.85.

Charcoals—Melyn grade, IC, scarce; Crosses, \$8; Allaway grade, IC, \$5.70; Crosses, \$7; Grange grade, IC, \$5.80; Crosses, \$7.10. Charcoal Terns—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.85; M. F., 14 x 20, \$7.50; do., 20 x 28, \$15; Dean grade, 14 x 20, \$5.30 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.70; D. R. D. grade, 14 x 20, \$5.25; do., 20 x 28, \$10.45; Dyffryn, 14 x 20, \$5.50; do., 20 x 28, scarce. Wasters—S. T. P. grade, 14 x 20, \$5; do., 20 x 28 \$9.75; Abercarne grade, 14 x 20, \$4.95; do., 20 x 28, \$9.62½.

New York.

Office of *The Iron Age*, 96-102 Reade street, }
New York, March 8, 1893. }

Pig Iron.—While the volume of business is fairly satisfactory the market is weaker, concessions being made by nearly all the districts which contribute to the supply of this territory. In addition thereto the Buffalo producers are offering Iron in Albany and Troy, \$14, delivered, being named for No. 2. The Thomas Iron Company report having booked quite a number of orders from old customers under the usual conditions. We quote Northern brands at \$14.50 @ \$15.25 for No. 1; \$13.75 @ \$14.50 for No. 2; \$12.75 @ \$13.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.25 @ \$14.75 for No. 1; \$13.25 @ \$13.75 for No. 2 and No. 1 Soft; \$12.25 @ \$12.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—Business is very light with 80 % foreign Ferromanganese nominally \$56 @ \$56.50, and 20 % Spiegeleisen \$25.25 @ \$25.50. English Spiegeleisen is selling as low as 70/, f.o.b. Liverpool.

Billets and Rods.—A purchase of a considerable amount of foreign Billets has recently been made by an Eastern Wire mill at private terms. It may be interesting to note also that lately a 500-ton lot of Wire Rods was sold by an Eastern Rod mill for export. We quote Steel Billets, tidewater, \$24.50 @ \$24.75; foreign, \$29 @ \$29.50; Wire Rods, \$32.25 @ \$32.75; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$54.50 @ \$56.

Steel Rails.—The Eastern Rail trade has relapsed into dullness, with very little prospect that any business of consequence will come forward for some time to come. Practically all the important roads, east of the Allegheny Mountains and north of the Potomac, have bought. Of the whole quantity only one lot of about 5000 tons went to a Western mill, because the terms of payment were such that none of the Eastern works would touch it. Some Southern orders are still expected, but there, too, the financial arrangements are not easily made to the satisfaction of both parties. We quote \$29 at tidewater.

Track Material.—Business is dull. Spikes are quoted at 1.90¢ @ 1.95¢; Fish Plates at 1.55¢ @ 1.60¢; Track Bolts, square nuts, at 2.40¢ @ 2.45¢, and hexagon nuts at 2.55¢ @ 2.60¢, delivered.

Manufactured Iron and Steel.—The volume of business closed during the past week has been light and the market is continually disturbed by the cropping up of occasional weak spots. The Manhattan Life contract, which calls for about 2000 tons of Steel, the bulk of it heavy riveted work, has been secured, so far as the material is concerned, by an Eastern Pennsylvania mill. In the Plate trade the market has been disturbed lately by the appearance as a seller of Tank Steel of a Pittsburgh mill which has not hitherto made this grade. We quote: Beams up to 15 inch, 2¢ @ 2.15¢; 20-inch, 2.35¢ @ 2.40¢ for round lots; Angles, 1.8¢ @ 2¢; Universal Mill Plates, 1.85¢ @ 1.90¢; Tees, 2.10¢ @ 2.30¢; Channels, 2.10¢ @ 2.20¢,

on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.80¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.25¢ @ 2.50¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.65¢ @ 1.9¢, on dock, and common 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.85¢ @ 2¢, and Links and Pins, 1.85¢ @ 2.10¢; Steel Hoops, 1.80¢ @ 1.90¢, delivered.

Merchant Steel.—The market continues irregular, with Machinery at 1.80¢ @ 2¢; Toe Calk, 2¢ @ 2.25¢; and Sleigh Shoe, 1.80¢ @ 1.90¢.

Old Material.—We quote nominally Old Iron Rails, \$16.75 @ \$17; Steel Rails, \$13.50 @ \$14, and No. 1 Scrap, \$16.

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, March 8, 1893.

Although not active, the market for Pig Iron warrants has shown rather more spirit. The fact that prices are abnormally low excites interest on the part of regular operators, and their efforts have been partially successful in attracting outside clientage. The movement in prices has been narrow, however, but on a rather higher plane, including 40/7½ for Scotch, 34/1½ for Cleveland and 46/ for Hematites. The returns of Cleveland makers' stocks are particularly favorable, showing as they do only 14,995 tons increase in February, despite the dull condition of trade. Stocks in public stores include 348,000 tons of Scotch and 49,000 tons of Cleveland. Exports of Pig Iron last month were 34,000 tons, against 40,000 tons in February, 1892.

In Pig Tin there has been a large speculative movement. Prices varied in response to conflicting advices from America regarding legislation upon the proposed duty. There is some appearance of a considerable "short" account in three months' futures, but the policy of leading operators is extremely uncertain and evidently dependent in a great measure upon developments in America.

The favorable statistics presented at the beginning of the month awakened a livelier interest in Copper, but purchases induced thereby were offset by sales by some large holders of warrants under which prices for Merchant Bar promptly receded to £45 8/9, subsequently recovering but little. The continental "combine," it is reported, have been large buyers of the remaining "syndicate" stock. Consumption is good and the outlook for further improvement favorable. Furnace material is scarce and dear. Sales recently include 900 tons Argentiiferous Montana Matte and 700 tons ordinary ditto on terms not made public.

Tin Plate market has been rather dull. Makers show some disposition to shade prices owing to lower cost of Bars, but no positive change in quotations has taken place thus far. There has been more inquiry for Black Plate, chiefly from Canada. Exports of Tin Plate in February amounted to 29 000 tons including 20,000 tons to the United States. Total same month last

year 33,000 tons, of which 23,000 tons to United States.

Scotch Pig Iron.—Market very quiet and prices still irregular, but showing very few changes.

No. 1 Coltness, f.o.b. Glasgow	54
No. 1 Summerlee, " "	50 6
No. 1 Gartsherrie, " "	48
No. 1 Langloan, " "	53
No. 1 Cambro, " "	48 6
No. 1 Shotts, " at Leith	52
No. 1 Glengarnock, " Ardrossan	49 6
No. 1 Dalmeilington, " "	47
No. 1 Eglinton, " "	44
Steamer freights, Glasgow to New York, 1/1	
Liverpool to New York, 7/6	

Cleveland Pig.—Moderate business passing and the market easy, with sellers at 34/3, f.o.b. shipping port, for No. 3 Middlesborough.

Bessemer Pig.—Demand continues slow, and prices are still easy, at 46/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Sellers somewhat firmer, but demand still rather slow. English 80 % quoted at £10. 15/, f.o.b. shipping port.

Steel Rails.—The market remains quiet and unchanged. Heavy sections quoted at £4, f.o.b. shipping port.

Steel Slabs.—Very little doing and prices the same as heretofore. Bessemer quoted at £4, f.o.b. at shipping point.

Steel Billets.—No change in character of business and former prices generally asked. Bessemer, 2½ x 2½ inches, quoted at £4, f.o.b. shipping point.

Steel Blooms.—The market remains very quiet, and prices are unchanged. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Old Iron Rails.—Slow market, and prices as quoted are nominal in a great measure. Tees quoted at £2. 7/6 @ £2. 10/ and Double Heads at £2. 10/ @ £2. 12/6, f.o.b.

Scrap Iron.—Very little doing, and former prices asked. Heavy Wrought Iron quoted at £2, f.o.b.

Crop Ends.—The demand very slow, but sellers ask former prices. Bessemer quoted at £2. 7/6 @ £2. 10/, f.o.b.

Manufactured Iron.—Business in all departments continues slow. Prices are not quoted lower, but still tend more or less in buyers' favor. We quote, f.o.b. Liverpool:

Staff. Ordinary Marked Bars	£ s. d.	£ s. d.
Common	8 0 0	@ 6 7 6
Staff. Bl'k Sheet, singles	7 7 6	@ 7 10 0
Welsh Bars (f.o.b. Wales)	5 7 6	@ 5 10 0

Tin Plate.—The market closed firm, but quiet. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	13/6 @ 14/0
IC Bessemer Steel, Coke finish	12/0 @ 12/3
IC Siemens	12/3 @ 12/6
IC Coke, B. V. grade 14 x 20	12/0 @ 12/3
Charcoal Terne, Dean grade	13/6 @ 14/0

Pig Tin.—Strong market at the close under the influence of demand to cover short account. Straits quoted at £94. 2/6 @ £94. 5/ for spot and £94 for three months' futures.

Copper.—Market barely steady at the close. Merchant Bars quoted at £45. 7/6 @ £45. 10/, spot, and £45. 15/ three months' futures. Best selected, £49. 10/ @ £50.

Lead.—Under better demand prices have stiffened to £9. 17/6 for Soft Spanish.

Spelter.—Business moderate, but prices firmer at £17. 15/ for ordinary Silesian.

The Electric Light Convention.

The sixteenth annual convention of the National Electric Light Association was held in St. Louis during February 28, March 1 and 2. There was a large number of delegates present, and unusual interest was manifested in the various papers read before the convention. Additional interest attached to the convention from the fact that Nikola Tesla, the greatest of modern electricians, was to lecture at the Grand Music Hall Wednesday evening, March 1. This portion of the programme doubtless drew some who otherwise might, perhaps, have remained away.

The convention was called to order at 10.30 Tuesday morning by President James I. Ayer, who introduced the Hon. E. A. Noonan, Mayor of St. Louis, who made a welcoming address to the delegates, after which Mr. Ayer read his annual address. Following this was the report of the Committee on World's Columbian Fair, read by Judge Armstrong, in the absence of B. E. Sunny, chairman of the committee. A. D. Adams read a paper on "Wrought vs. Cast Iron for Field Magnet Frames."

The meeting was called to order at 2.30 on Tuesday afternoon, and a paper by Capt. Wm. Brophy, on "The Relation of Insurance to Electric Light and Power," was read, which was followed by a paper on "Some Experiences with the Alternating System," written by R. H. Sterling and read by Judge Armstrong. Adjournment followed the reading of this paper. In the evening carriages were provided for the delegates, who were driven to the power plants of the Municipal, Missouri & Union Depot Company.

Professor Forbes of London, England, who is known to fame as the man who attempted to utilize Niagara for electric power producing, read an interesting paper, the subject of which was "Thermal Storage for Central Stations." This paper was pretty generally discussed, so much so, in fact, that the entire morning session was devoted to it.

On Wednesday afternoon there were three papers on the same subject, as follows: "Long-Distance Transmission of Power," by Chas. S. Bradley; "Under What Conditions is the Use of Water Power Economical?" by L. B. Stilwell, and "Power Transmission for Central Stations," by Louis Bell. After the reading of these papers, which all proved interesting, the convention adjourned.

Over 5000 tickets of admission were issued for the Tesla lecture on Wednesday evening, and that they were all used was evidenced by the tremendous crowd present when Mr. Tesla was introduced to the audience. Lack of space forbids entering into the lecture in detail; suffice it to say that no lecturer ever received the unstinted applause of a critical audience with more modesty, and while a number of experiments made by Mr. Tesla apparently achieved no practical result, it is interesting to know that he is experimenting in the direction which was indicated by his tests, and hopes to achieve success. After the lecture an impromptu reception was held by Mr. Tesla.

On Thursday morning the convention listened to a paper by W. H. Browne entitled "Underground Conducts and Conductors," which was read by Mr. Hammer, after which Calvert Townley read his paper on "The Incandescent Light from a Commercial Standpoint."

The closing hours of the convention on Thursday afternoon were devoted to the reading of a paper on "The Preservation of Poles and Cross Arms" by H. C. Meyers, after which the regular announcements were made and the officers for the coming year introduced. They are as follows: President, E. A. Armstrong, Camden, N. J.;

first vice-president, M. J. Francisco, Rutland, Vt.; second vice president, C. H. Wilmerding, Chicago, Ill. Executive Committee: John A. Seeley, New York, re-elected; E. F. Peck, Brooklyn, N. Y., re-elected; A. J. De Camp, Philadelphia, Pa., to succeed Charles R. Faben, Jr.; W. J. Morrison, Woodstock, Canada, to succeed M. D. Law; H. J. Smith, New York City, to succeed Robb MacKie; G. H. Baxter, Pittsburgh, Pa., to succeed C. Lee Abell. After the introductions a vote of thanks was extended to the citizens of St. Louis, the St. Louis Electric Club, the Electrical Exchange and the press for many courtesies extended. This terminated the general business of the convention.

NEW PUBLICATIONS.

FOURTEENTH ANNUAL REPORT OF THE BUREAU OF STATISTICS ON LABOR AND INDUSTRIES OF NEW JERSEY. James Bishop, Chief of Bureau, Trenton, N. J.

A voluminous report, covering over 600 pages, conveys some interesting data concerning labor legislation in New Jersey and other matter relating to industrial occupations and associations in that State for the year ending October 31, 1891. The bureau has diligently recorded a considerable mass of labor legislation and the decisions of the higher courts of New Jersey in interpretation of the rights and duties of workmen. The latter is a new feature in the report, and one of considerable interest. Among the legislation of special note recorded in the document are the acts creating a State Board of Arbitration, and a commissioner for the inspection of mines, the law limiting employment in factories to 55 hours per week, the modification of the mechanics' lien law amendment of 1890, and the anti-Pinkerton act, all of which are of some moment in relation to the labor question. More than half the volume is devoted to a consideration of the co-operative building and loan associations of New Jersey, the results of extended inquiry into the operations of these societies being presented in a series of tabulated forms. The reports show 271 co-operative associations of this character to have been in existence in 1891, as compared with 254 in the previous year. The net assets of these State enterprises amounted to over \$25,000,000, an increase of \$3,500,000. The remainder of the document gives the results of the third year of inquiry into the effect of occupation on the health and working life of those engaged in a number of industrial pursuits. For the year under review the investigation has taken in 13,000 journeymen, employed as carpenters, painters, bricklayers and masons, stonecutters, plumbers, printers, glassblowers, hat finishers, miners of iron ore and potters—a fairly representative selection of industries. Tables annexed to this section give ages when journeymen began to work, present ages, ages of decline, number of years at work and diseases from which incapacitated. Of these trades carpenters and bricklayers come out, as might be expected, on the top, followed by potters and miner, while glassblowers and printers show the most unfavorable results.

Last week a 24 inch beam weighing 100 pounds to the foot was rolled down in the Homestead works from a 5 ton-ingot in one heat. This is not the largest sized beams, however, that are rolled at the above establishment, their equipment allowing them to roll up to 36 inches. In the 23 and 33 inch mills of the above plant electric power is being introduced and an entirely new equipment will be put in during the next three months. When completed all the machinery in the above mills will be operated with electricity.

HARDWARE.

Condition of Trade.

MARCH BUSINESS thus far, although good, has not shown as much increase in volume over the latter part of February as was expected. While the demand is good and probably up to the average, purchases are not made as freely or in as large quantities as was hoped. The prevalence of severe weather in the Northwest has had a good deal to do with holding back trade in that important section, but with the opening of spring it is expected that there will be a general quickening in trade. There is also some unevenness in business, some manufacturers reporting a heavy and very satisfactory trade, while others refer to the demand as only fair. In heavy goods there appears to be a better business doing than in Shelf Hardware, and some of the manufacturers find it difficult to supply the goods as fast as required. Prices continue without important change with a maintenance of the improved feeling in some lines. Collections are fairly good, but in some cases complaint is made of sluggishness.

Chicago.

(By Telegraph.)

March has not realized the expectations of Shelf Hardware jobbers in the volume of business. Last week was exceedingly wintry throughout the whole Northwest, checking trade in every direction. Orders are better this week, which has opened in a way to encourage merchants in the belief that business will be large as soon as something like spring weather prevails throughout the agricultural sections. The heavy Hardware trade, on the other hand, is very much better than it has been, owing to the increasing demand from all classes of manufacturing consumers. Collections are still below the average and considerable complaint is heard of the scarcity of money. The remarks previously made with regard to the holding of grain stocks by farmers have covered this ground, but it is expected that as soon as spring opens and the grain in the lake harbors as well as in farmers' hands can be forwarded to Eastern markets, the situation will be very greatly improved in this respect.

St. Louis.

(By Telegraph.)

The demand for Shelf Hardware is daily increasing, and the present month promises to be an extremely heavy one. The severe weather prevailing in the North and Northwest cuts that territory off from the market to some extent, but orders are now being received, which proves that they are doing their share of the business.

Cut Nails are in good demand, as are also Wire Nails and Barb Wire. Paints, Farm Tools and Implements, Wagons and Wagon stock, Builders' Hardware, &c., are all in good demand. Local jobbers also report a good demand for summer goods. Collections are above the average.

Notes on Prices.

Wire Nails.—The Wire-Nail market is in excellent condition and the recently advanced prices are regularly maintained. Notwithstanding the successive advances business continues good, and the mills are booking a good many orders and have many inquiries. The fact that most of the large jobbers have heavy stocks on hand purchased at the extremely low prices which ruled a few weeks ago is referred to as likely to interfere somewhat with the demand on the manufacturers, as the jobbers are in a position to meet if not undersell factory quotations. The present quotation is \$1.50 for carload lots at mill, Pittsburgh being the point of equalization for the East and Cleveland for the West.

Chicago, by Telegraph.—Manufacturers of Nails report a quiet condition of trade. The advanced price has checked new business. Factories are well sold up, however, the largest of them reporting their full capacity engaged for the months of March and April. The regular quotation now from factory is \$1.65, Chicago. This is the same price made on carload lots by jobbers, who are also quoting \$1.70 for small lots. The jobbers report a good business, which only needs a few days of fine weather to develop into large proportions.

Cut Nails.—The condition of the Cut Nail market is substantially the same as last week. It is characterized by an improved tone and a good demand, with the promise of a heavy trade during the season. The mills are quoting almost universally on the basis of the Wire Nail card recently adopted by them, their price being in the East \$1 25 base for carload lots at mill, and, while this price is fairly well maintained, it is sometimes shaded a little. The quotation for carload lots in New York is \$1.40. The modifications in the extras on Clinch Nails made by the Eastern manufacturers at their Philadelphia meeting have not yet been adopted by the Western mills, and it is doubtful whether they will be, so that in this respect there is a slight difference in the cards used in the East and West. While this difference will cause but slight inconvenience, it would be more satisfactory if but one card applied to the whole country. Some criticism is expressed because under the Nail card now in use the matter of averages is considered in making quotations, even though it may not be explicitly referred to, inasmuch as manufacturers of both

Wire and Cut Nails expect that orders will have about a 50-cent average, and decline to sell large Nails alone at the price of an assorted order. The adoption of the same card for both kinds of Nails is, however, an important step in advance and does a good deal to simplify the purchase of Nails. It would be a matter for congratulation, however, if the card were so graded as to obviate the necessity of considering the question of averages. In order to do this it would be necessary for the Nails to have extras which would correspond to their cost, so that it would be a matter of indifference to the manufacturer what kinds or sizes were purchased. So long as the card is unequally graded, as at present, the question of averages will, however, have to be considered. For the convenience of the trade we give below the Nail card now in use, showing the difference on Clinch Nails as maintained by the Eastern and Western manufacturers:

National Cut Nail Schedule.

Adopted Feb. 15, '93.
Revised Feb. 21, '93.

Common, Fence, Brads and Sheathing.		Light Barrel and Lining.	
	Advance.		
60d.....	Base \$0.10	1 inch.....	\$1.90
50d.....	.25	3/8 ".....	2.20
30d and 40d.....	.25	3/4 ".....	2.50
20d.....	.35		
12d and 16d.....	.45	Common Barrel and Roofing.	
10d.....	.50	1 1/2 inch.....	.90
8d and 9d.....	.60	1 3/4 ".....	1.00
6d and 7d.....	.75	2 ".....	1.20
4d and 5d.....	.90	2 1/2 ".....	1.40
3d.....	1.20	3 ".....	1.50
2d.....	1.60	3 1/2 ".....	1.75
		4 ".....	2.00
Flooring, Casing, Box and Finishing.		Slatting.	
		5d.....	.90
30d and 40d.....	.40	4d.....	1.00
20d.....	.50	3d.....	1.20
12d and 16d.....	.60	2d.....	1.40
10d.....	.65		
8d and 9d.....	.75	Boat Spikes.	
6d and 7d.....	.90	All sizes.....	.75
5d.....	1.10		
4d.....	1.25	Clinch.	
3d.....	1.50	4 inch.....	.85
2d.....	1.75	3 1/2 and 3 3/4 in.....	.95
		3 inch.....	1.00
Fine Finishing.		2 1/2 and 2 3/4 in.....	1.10
4 inch.....	.60	2 and 2 1/4 in.....	.90
3 1/2 and 3 3/4 inch.....	.65	1 1/2 and 1 3/4 in.....	1.00
3 inch.....	.75	1 1/4 inch.....	1.40
2 1/2 and 2 3/4 inch.....	.90		
2 and 2 1/4 inch.....	1.10	Tobacco Mfrs.' Box Nails.	
1 3/4 ".....	1.25	6d and 7d Lining.....	.75
1 1/2 ".....	1.45	4d and 5d.....	.90
1 1/4 ".....	1.65	4d and 5d Caddy.....	1.20
1 ".....	1.90	3d Caddy.....	1.60
Fine Blued.		Cooper, Tobacco and Warehouse.	
4d.....	1.25	10d.....	.60
3d.....	1.60	8d.....	.70
2d.....	1.90	6d and 7d.....	.85
Cut Spikes.		4d and 5d.....	1.00
All sizes.....	.50		

Each half keg 10 cents extra.

Chicago, by Telegraph.—The Wheeling makers of Steel Cut Nails are now having a decided revival of trade in the district from the Mississippi River west, which they are able to reach in competition with Chicago manufacturers. The new Nail card, they claim, is being strictly adhered to, and quotations are not being made on the base of an average. It is asserted, however, by jobbers that special prices are being quoted on orders covering particular sizes on which the average is high. It evident that the trade in Cut Nails is

subject to a discount of 2 per cent. for cash in 10 days:

Eaves-Trough Hangers—Yankee Adjustable.

	Per gro.
3 inch cross bars.....	\$5.50
3½ " " ".....	5.50
4 " " ".....	6.00
4½ " " ".....	6.00
5 " " ".....	6.50
5½ " " ".....	6.50
6 " " ".....	9.50
7 " " ".....	12.50

The Boss.

Straps riveted on cross bars complete.

	Per gro.
3 inch.....	\$3.50
3½ ".....	3.50
4 ".....	3.75
4½ ".....	3.85
5 ".....	4.00

Wrought-Iron Pipe.—The market in Wrought-Iron Pipe continues weak and demoralized, and being an open one manufacturers are free to make such figures as they choose. The following revised quotations have recently been issued by the Nason Mfg. Co., 71 Beekman street, New York:

	Per cent.
Plain, 1¼ inch and smaller sizes....	60 and 10
" 1½ " " larger ".....	70 and 10
Galvanized, 1¼ inch and smaller sizes.....	52½ and 10
Galvanized, 1½ inch and larger sizes.....	60 and 10

Extra and Double Extra Strong.

Plain, 1¼ inch and smaller sizes.....	60
" 1½ " " larger ".....	70

Glass.—Quietness continues to be the prevailing feature of the glass market, both in the city and with out of town trade. The prospects of mild weather, which would give employment to the building trades, were changed by snow and storm, and until settled weather is assured Glass will be in small demand. National Window Glass prices are being adhered to by members of the association, while jobbers who are not members are quoting somewhat lower prices, equivalent to 2½ to 5 per cent. Imported Glass has not recovered any of its lost ground and is being sold from 75 and 10 and 5 to 80 and 5 per cent discount. In Plate Glass the situation is unchanged, there being almost no demand. Quotations remain as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount to 80 and 5 per cent. discount. American Plate ranges in price from 60 and 2½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

The Hardware Club of New York.

ANNUAL MEETING.

THE ANNUAL MEETING of the Hardware Club of New York will be held on Saturday, March 18, 1893, at 3 p.m., in the parlors of the Cosmopolitan Hotel, corner Chambers street and

West Broadway, for the election of 15 governors, and to transact such other business as may be brought before the meeting. A full attendance of members is desirable.

Letters From the Trade in Regard to the New Cut-Nail Card.

IN ORDER to represent the opinion of the trade at large in regard to the adoption by the Cut-Nail manufacturers of the Wire Nail Card, as referred to in our last issue, we give below extracts from letters received from representative Hardwaremen, both wholesale and retail, in which they discuss the question from their respective points of view. It will be observed that the general verdict is favorable to the action of the manufacturers as tending to simplify business in this line. Some of our correspondents, however, take another view and criticize the card which has been adopted. It will be seen that the largest jobbing houses in the country, as well as many representative retailers, are among our correspondents from whose letters extracts are given:

HIBBARD, SPENCER, BARTLETT & Co., Chicago.—We approve of the action of the Cut-Nail manufacturers in adopting the Wire-Nail card. We consider it a move in the right direction.

WELLS & NELLEGAR Co., Chicago.—The adoption of the Wire-Nail card by the Cut-Nail makers suits us well, as it simplifies our Nail trade.

HORTON, GILMORE, MCWILLIAMS & Co., Chicago.—We approve the change of card made by the Cut-Nail manufacturers. By adopting the Wire-Nail card they have placed Cut Nails in such relation to Wire that there is no confusion in prices, which has heretofore existed, and all parties, especially the retailer and consumer, will be benefited. If the manufacturers, in dealing with the trade, will now adhere to the scale and not vary their prices according to percentage of sizes as heretofore, there will be more stability in prices, which is certainly a desirable thing, in our estimation.

J. WOODWELL & Co., Pittsburgh, Pa.—We think the adoption of the Wire-Nail card and making price of Steel Cut Nails irrespective of average the proper method and meets our views exactly.

PHILLIPS & Co., Niagara Falls, N. Y.—We think that the one card for both Wire and Cut Nails would be an excellent thing, as it would avoid having another list to carry in mind. A person would thus be enabled to get posted on the one list very much quicker than if he had two lists to study. We are in favor of it by all means.

HAMILTON & MATHEWS, Rochester, N. Y.—The adoption of a uniform card for both Wire and Cut Nails will be a con-

venience to the retail trade, and each kind will sell on its own merits.

PACKARD HARDWARE Co., Greenville, Pa.—We hardly see how such a basis of extras can be maintained, when it was impossible to do so on the old Cut-Nail card, with extras much less than on this one. For instance, had one wished to purchase a carload of 4d prior to this change he would have found sellers at \$1.85 per keg. On the new card at \$1.25 rates, these would cost \$2.15 per keg, making a difference of \$72 on 240 kegs. While it is a nice thing in theory, the very nature of things, based on cost, seem to say that it will be short lived.

BRADFORD KENNEDY & SONS, Syracuse, N. Y.—While we have sold very few Nails based on the new cost, we believe it will give much better satisfaction than the recent card. We plainly see one advantage—that is, that the smaller trade can sell the Cut and Wire Nails from the same card, thereby diminishing the chances of mistakes.

C. M. MCCLUNG & Co., Knoxville, Tenn.—The adoption of the Wire-Nail card by the Cut-Nail manufacturers, as viewed from the jobbers' standpoint, is like "jumping out of the frying pan into the fire."

The trouble with the the old Nail card was that the high average of extras induced the manufacturers to offer a premium on small Nails in the way of lower prices for a high average of specifications; and instead of overcoming this evil they have actually increased the average of extras, until we presume no manufacturer will contend that the cost of extras over base is only half what is represented by the card.

They claim to quote irrespective of average, but we would like very much to see a jobber buy a carload of 60d Nails at the base price, and we think to get the bottom price, the jobber will be required to submit specifications with order.

Just what the manufacturers were driving at is hard to determine, unless it was for the sake of being able to name a lower base price for Cut Nails than for Wire Nails, but we do not think this obviates the difficulty, as it brings the exact relative cost of every size of Nails directly before the consumer; and we take it for granted that with a difference of, say, 15 cents per keg all the way through the list, the Wire Nails still have the floor "by a large majority."

A. H. FOGG & Co., Houlton, Maine.—We would like it much better if the same card could be arranged for both Cut and Wire Nails. The boys can remember Wire card much easier, and it is better for our customers.

A. N. LEWIS, Willmor, Minn.—Anent the existing Nail-card muddle, may the retailer lift his voice? What we want is the same card for both Cut and Wire Nails, with a 10d base, including all larger sizes, and a list of extras based on actual increase of cost for smaller sizes; and we do not want that card changed every month or two, that we may explain to our customers why this is thus.

W. T. SNEED & BRO., Gordonsville, Va.—We think each and every keg of Nails should be sold as each article of merchandise is sold—on its own merit and value—that the manufacturer and dealer make his profit whether all 60d or all 2d Nails are sold, and that the price should be based on 10's, of which size there are more sold than any other. If the extras on Wire Nails are more or less than they should be on Cut Nails by actual cost to the manufacturer, then the card should not be in conformity to the Wire-Nail card. If larger than 10's cost the manufacturer less than 10's and smaller more, put extras on smaller than 10's and *vice versa* as to larger than 10's. By all means the 10's should be the base for several reasons. We believe in that new arrangement most emphatically.

JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis.—We think the new card will be satisfactory to all after the merchants get used to it. It is an advantage to have the same difference of prices between the different sizes on Steel Cut as well as Wire Nails. We have found considerable trouble and annoyance in using the two different cards. We think that the new departure, selling the Steel Cut Nails at the same list as the Wire Nails, will be a great improvement all around, and will give the buyer a chance to know at once the difference between the price of Cut Nails and Wire Nails. We are much pleased with the change.

MORTON MINOT, Brockport, N. Y.—Dissatisfaction and unrest will characterize the Nail market until the Nail cards truly represent the values of each size and kind of Nails. By value I mean the cost of product plus a fair profit. If Cut-Nail cards of the past have properly represented values, then the adoption of the Wire-Nail card for Cut Nails will practically abolish the Cut-Nail card, for dealers will be unable to estimate the cost of an invoice until specifications have been submitted to the mills competing for their trade. The very fact of the mills desiring to see what extras an order will carry before making a base price is a clear confession of the worthlessness of any Nail cards existing under such conditions. Give us a Nail card truly representing values, and let it remain until new conditions make it a misrepresentation, and then right it at once.

EDWARDS & WALKER, Portland, Me.—Our impressions are that one list for both Cut and Wire Nails will work to the advantage of the former by defining clearly the difference in cost. It is a decided advantage to the dealer in having one less list to remember. And the trade will adopt this change more readily than they could an entirely new list.

PADDOCK-HAWLEY IRON COMPANY, St. Louis.—It is our opinion that it will work a benefit to the retail buyer of Nails, and possibly to the manufacturer; but its tendency will be to cut down the margin of the jobber and wholesale dealer, inasmuch as it simplifies the matter of getting quotations direct from the mills and brokers. The new card is certainly an advantage to all who handle Nails in that it does away with considerable clerical

work in figuring averages, &c., but we do not believe the question is one of very vital interest to most of the large dealers in Nails, as the margin of profit has become so narrow that the Nail business has become a very small consideration with such merchants.

KENT IRON HARDWARE COMPANY, Wilmington, Del.—It is our opinion that the new extras on Wire Nails will not be as satisfactory as the old. We prefer the card adopted early in February, as it bases every size Nail at its actual cost.

HOMER FOOT & Co., Springfield, Mass.—We are much in favor of the new Cut-Nail card, and especially like it as it is virtually the same as the Wire-Nail card. We hope and think that the manufacturers will not enforce the special notice as to average price of 10d.

THOMAS FOSTER & SONS, Utica, N. Y.—We approve of the change. It simplifies business to a great extent, and there is no reason why the expense should be different on the two Nails.

GRIER BROS. COMPANY, Du Bois, Pa.—We think a uniform list the proper thing and should be adopted for both Wire and Cut Nails.

RANKINS-SNYDER HARDWARE COMPANY, Louisville, Ky.—We have concluded that the adoption of the Wire-Nail card by the Cut-Nail manufacturers is but an acknowledgment of a long-standing fact and at the same time a very ruinous procedure, necessarily resulting in complications and misunderstanding between the buyer and seller, because both Wire and Cut have the same list, when in our humble opinion they should not be the same.

CLEMENS VONNEGUT, Indianapolis, Ind.—I hope the Nail manufacturers will always agree on the same scale of advances. I find it to be highly satisfactory and can see no reason why it should not be continued, unless the respective costs of manufacturing Iron and Wire Nails do not run in the same proportion for different lengths.

CHASE, BARKER & Co., Calais, Ind.—We think the same card for both Cut and Wire Nails would be a great advantage indeed, and hope it will be brought about.

M. E. EBBECKE COMPANY, Allentown, Pa.—The use of the same card for both Cut and Wire Nails strikes us very favorably.

FREEMAN, DELAMATER & Co., Detroit, Mich.—It is difficult to give a correct expression so early, as the card has only been adopted a short time, but our impression is that it is probably about the best thing that could be done. Taking the same card on both Wire and Steel Nails, a purchaser can readily see and judge for himself which is the cheapest and most profitable Nail to purchase. Our opinion is that it is an improvement over the old way.

BUHL, SONS & Co., Detroit, Mich.—We think the Cut-Nail manufacturers have acted very wisely in adopting the Wire-Nail card. Our reason is this: The retail trade ask rates on Nails, and do not take the time to figure out the difference

in prices, merely judge by the rates without figuring, and many times are deceived in the actual difference in price. Now with the same list it will soon be demonstrated whether the dealer and consumer are willing to pay more for Wire Nails than Cut.

ODELL HARDWARE COMPANY, Greensboro, N. C.—I see no objection to the use of the Wire-Nail card for both Cut and Wire; in fact, I prefer it, as it saves confusion and one can more accurately compare the relative cost of the two. In this connection I desire to say that I think it is time that the Nail dealers should adopt some list and let there be some decided basis for all to operate on. I never objected to either of the old lists, though I think this one superior to any one heretofore in use. I cannot see how the jobber could reasonably object to this card; if he buys and sells on the same card it is one and the same in the end. If the manufacturer is favored by this card it is O K, the price of Nails will be regulated by supply and demand, so in the end it will adjust itself. This is a good card and we are going to use it.

S. B. HUBBARD COMPANY, Jacksonville, Fla.—We have only started to use the new Cut-Nail card, and have not as yet had an opportunity to hear from our trade in regard to same, but we are very much in favor of it, as it will only tax our men with remembering one lot of advances, where, with the old card, they would have to carry in their heads the advances on two different cards.

BIDDLE HARDWARE COMPANY, Philadelphia.—We are glad to see the adoption by the Cut Nail manufacturers of the Wire-Nail card. As they now stand the two cards are substantially alike and we think this will result greatly to the convenience of the trade, as the cost of the two kinds of Nails can now be compared readily. There is one cause for regret, however, namely, that Cut Nail men have not yet succeeded in arranging a card which will allow each size and kind of Nails to be sold on its own basis. As we understand it the present card is an approximation to this, and will not encourage the pernicious habit of selling according to a scale of extras, as formerly was the case with the old card. Still this card is not perfect, and manufacturers are declining to take orders for large sizes only, and in our opinion the interest of the trade in general will be best served by the adoption of a card which would permit manufacturers or jobbers to take orders either for one kind and size of Nails, or for the entire line, without paying any attention whatever to the rate of extras.

HOWELL, GANO & Co., Cincinnati, Ohio.—Regarding the adoption of the new card for Cut Nails to correspond with Wire-Nail advances, we are heartily in accord with it, provided it will not necessitate the renewal of the system of selling according to average, an evil which has been in force for several years, and one which has rendered the Hardwareman's life a burden. We are not in a position to judge as to the relative cost of the different sizes of Cut Nails, and in this connection there seems to be a wide

variance of opinion among the manufacturers themselves. We trust it will be held strictly without regard to average, and should this be the case, feel satisfied that the trade generally will be fully in accord with the change.

GRAY, FALL & CO., Nashville, Tenn.—We are well pleased with the new Wire-Nail card adopted by the Cut-Nail manufacturers at their last meeting. We immediately adopted the new card in our business, and have had no complaints whatever. We cannot see that it will enable us to make more money on Cut Nails, but it is more convenient, and then we only have to have one Nail card. So far as we have heard all the jobbers in this section have adopted the new card.

J. D. WEED & CO., Savannah, Ga.—We think the adoption of the Wire-Nail card for Cut Nails is a mistake; the difference in the extras above base is too great, and will cause the jobber trouble.

BRANSFORD HARDWARE COMPANY, Nashville, Tenn.—We are entirely satisfied with the new method of quoting Cut Nails.

VAN CAMP HARDWARE & IRON COMPANY, Indianapolis, Ind.—It is not of much consequence to the dealers in this section of the country, as Steel Nails are practically out of the market. We think, however, that it is a very desirable change, as it will be much more convenient to have them uniform.

J. M. WARREN & CO., Troy, N. Y.—Until we have given the new card of extras on Cut Nails a trial it is difficult to arrive at a definite conclusion. However, we are well satisfied that the manufacturers have done away with the rebate idea, and we think the adoption of the same list of extras as used by the Wire-Nail people is right in theory, and should work satisfactorily for all concerned.

SIMMONS HARDWARE COMPANY, St. Louis.—We think the recent action of the Cut-Nail manufacturers in adopting the Wire-Nail card a very wise one for many reasons. It simplifies matters by enabling the user to know at once the comparative cost of the two kinds of Nails. It is also an advantage to have a uniform Nail card. Furthermore, by basing the advances of each size and kind on the actual costs it does away with the question of averages, and thus enables the buyer to specify according to his wants, and not with a view of obtaining a good price based upon a certain average.

CHURCH & MORSE, Meriden, Conn.—The change is a good one and less confusing to the purchaser and will require less time to show difference in price of Wire from Cut Nails.

C. J. RUMSEY & CO., Ithaca, N. Y.—We approve of the new Cut-Nail card as at present, and hope the Nail men will not make another change. It gives a fellow who keeps both Cut and Wire Nails less trouble to remember the lists.

FRYE, PHIPPS & CO., Boston, Mass.—We think the card as adopted by the Cut-Nail manufacturers to be the most preferable of any. Cut and Wire Nails are now placed upon the same base of cost and it is easy for the consumer to deter-

mine which it is for his advantage to purchase.

Export Notes.

W. H. DOUGLAS, of Arkell & Douglass, exporters, 95 Broad street, has returned from Australia, where he went early in October last on business connected with his house, arriving in New York February 27.

Markt & Co., exporters, 91-95 North Moore street, New York, with branches in London and Hamburg, have now in preparation an extensive illustrated and descriptive catalogue, showing goods of American manufacture. It will be divided into seven volumes, designated as sections A to G, inclusive. Each section is confined to analagous goods. Thus one book will deal exclusively with tools, machinery, &c., another with Builders' and Cabinet Hardware, another with Clocks, &c. By this method one or more books can be sent a customer, and he is not compelled to look through a large book to satisfy a few wants. This is a departure in the right direction. The series will be in the English, German, and Spanish languages, and is being compiled exclusively for the export trade, containing only such goods as are suitable for foreign markets. The work is now in press and will be issued so as to be of use during the Columbian Exposition. The above concern, while aware that traffic with some of the European countries is not as good as they would like to see it, caused partly by changes in tariffs abroad, refer to their Scythe Stone trade as excellent. They are the export agents for the Pike Mfg. Company. They estimate their export shipments of these goods for this season as fully equal to 50 carloads, and add there is a promising outlook for Oil Stones. This in spite of the advance in price is to them conclusive evidence that American Stones of this nature are well liked in Europe.

The Deming Company, Salem, Ohio, have just received from the press for distribution the twelfth edition of their illustrated and descriptive catalogue of Iron and Brass Pumps, Hydraulic Rams, Well supplies and Tools, Pump fixtures, &c., manufactured or handled by them. This edition is printed in Spanish for the export trade for circulation wherever this language is spoken, largely, however, in the West Indies, Central and South America. The agencies and warehouses of the company are located at New York, Philadelphia, Chicago, Kansas City, Omaha, Los Angeles, San Francisco and London, England.

• The total exports from the United States to foreign ports for January, 1893, were \$84,271,531; the total imports for the same time were \$86,090,319, showing a balance against this country of \$1,818,788.

Maximo E. Mora, 72 John street, New York, is now in Cuba in the interest of the several manufacturing companies represented by him, having sailed from this port on the steamer "Yucatan," February 25. Among the concerns for which

he does business are the Deming Company, Salem, Ohio, Pumps and Hydraulic Machinery; James Lappan & Co., Pittsburgh, Pa.; R. F. Hawkins, Springfield, Mass., and the Kirby Mfg. Company, Cleveland, Ohio, manufacturers of all kinds of Machinery for sugar plantations.

American buyers have bought more wool at the last sales in Melbourne than ever before, reaching a total of 32,000 bales. Purchases of this staple have been almost exclusively confined to the English market heretofore, instead of at the source of supply. This is regarded as a favorable sign, as it provides considerable return cargo for vessels carrying manufactured goods from this country, a condition greatly desired.

Paul F. Gerhard & Co., 19 Whitehall street, New York, long agents for the United States & Brazil Mail Steamship Company, have inaugurated the Standard Steamship Line, the steamer "Ethiopia" being appointed to sail from New York March 18, and Baltimore March 23, for Pernambuco, Bahia, Rio de Janeiro and Santos.

The long-continued drought throughout Paraguay, besides resulting in a general loss of staple crops, is causing much suffering. Gold is now at 800 per cent. premium and no exportations from the country are being made. The two leading banks have gone under.

Uruguay in the line of retrenchment has suppressed all her foreign legations.

Salvador and Nicaragua have adopted a gold standard. With practically no gold in either country, it is difficult to see how by legislative enactment such a standard can be maintained. Owing to the uncertainty growing out of the situation business is being done on a very conservative basis and not much at that.

Ecuador is said to have offered the Galapagos Islands to Germany as a coal-ing station. They are situated west of Ecuador in the Pacific Ocean on the equator and about 90° longitude west of Greenwich.

Among the rates now in force in the new customs tariff of the Argentine Republic may be mentioned the following, ad valorem duties: Firearms and Powder, 50 per cent; Plows, Wire and Machinery, 5 per cent.; goods not specified, 25 per cent. Specific duties: Galvanized Wire, \$5 per ton; Steel Bars, \$25 per ton. There is an export duty of 4 per cent. on all wool, hides, beef, tallow, &c.

Edgar T. Ely, formerly of New York, but for many years engaged in introducing merchandise of American manufacture at Buenos Ayres, arrived in New York, February 21, on the steamer "Advance," of the United States & Brazil Mail Steamship Company, after a pleasant passage of 38 days. He is here in the interest of the various lines dealt in by him, and will remain in this country until the coming June, making his headquarters with the Union Nut Company of this city. The method of doing business until

now has been to create a demand for American goods by going directly to the consumer, which has resulted in the building up of a large retail trade, requiring a store 35 feet front by 200 feet in depth, handling, in addition to other goods, largely of Gas and Oil Stoves, Plated Ware, Lamps and Furniture. Having established American goods on a firm footing against foreign competition, a departure is about to be made in the direction of a wholesale business.

The re-establishment of the Norton line of steamers to River Plate and Parana River ports was very opportune in view of the difficulties that have overtaken the U. S. & Brazil Mail Steamship Company. Freight arrived and *en route* for Montevideo, Buenos Ayres and Rosario intended for the steamer "Advance," owing to the libeling of the latter, was lightered and otherwise transferred to the Norton steamer "Newcomen," which sailed March 2, carrying 42 bags of U. S. mail matter. The large amount of freight thus unexpectedly received by Norton & Son did not materially advance the extremely low rates already quoted. The steamers "Ashford" and "Lamington" are expected to follow about March 25 and April 25, respectively, from load- ing berth at Empire Stores, Brooklyn.

R. H. Dana, of R. H. Dana & Co., 15-25 Whitehall street, New York, sailed for Liverpool recently on the steamer "Majestic" on business connected with his house relating to export and import interests.

Just previous to the departure of the last mail for the United States from Australia the Shiels-Berry Government went out of power on a vote of want of confidence. The Governor, Lord Hopeton, summoned J. B. Patterson, who formed a new ministry. Advices indicate that but little confidence will be felt until another appeal has been made to the country, when the prediction is made that the adherents of a lower tariff will surely control Parliament. The difficulty regarding the tariff question in Victoria seems to have been that while the measure was designed to increase the revenues of the colony, it has had a contrary effect, either decreasing or prohibiting importations. The object sought was simply to furnish more money to run the Government with, rather than as a protective measure or for the fostering of home manufacture, the conditions being unfavorable for the production of goods there.

The trip of the party of American manufacturers, under the auspices of the Australasian Publishing Company of this city, who left New York on a special train January 31 for a tour of Mexico, came to an end March 6 on the arrival of the steamer "Orizaba" at New York. There were 64 gentlemen, several of whom were accompanied by their wives. The party was made up of prominent members of large manufacturing concerns, all representing different interests, who were desirous of ascertaining from actual observation and contact

with Mexican merchants how more goods could be profitably sent there in competition with those of Europe. The first stop was made at Monterey, where they were entertained by the Chamber of Commerce. Thence to San Luis Potosi, where a banquet and ball were given by the merchants and attended by the Governor and other officials. At Mexico City they were received by President Diaz and the leading manufacturers and merchants of the capital. Other cities, including Pueblo, Merida and Vera Cruz were visited, where the party was enthusiastically received and entertained by the several governors in state under orders from President Diaz. They left Vera Cruz February 23, stopping at Havana. On the way back a permanent organization was formed and christened the American Manufacturers' Association.

Manufacturing Specialties.

A MANUFACTURER of a line of standard goods had been complaining of the total lack of profits in his business to a sympathizing friend, when the latter was struck by a brilliant thought and asked, "Why don't you take up a specialty and drop staple articles that everybody is making?" The unexpected reply was, "There is too much competition in specialties themselves." We venture to say that this idea is as new to a majority of our readers as it was to the man who asked the question. But, with comparatively few exceptions, it is too true. The mechanical genius who can at this time devise some novelty which does not come in direct competition with something else capable of doing the same thing or answering the same purpose is a genius indeed. Take small wares, for instance, such as are used in the kitchen. The ingenuity of inventors has been racked to get up numberless devices for beating eggs, for sifting flour, for grinding coffee, &c. Appeals are mutely made by every form of apparatus to the housewife's neatness, celerity, mechanical taste or curiosity, but there are so many articles of such totally different kinds warranted to do the same thing precisely in the most satisfactory way that she is bewildered and is as likely to select the least efficient as the best. The same remarks would apply to mechanics' tools, to personal furnishings, to wagon and carriage supplies, to so-called railway specialties, &c. There was a time when labor-saving automatic machinery began to take the place of toilsome hand labor, when a man of acute perception and mechanical knowledge could easily see an opportunity for the invention of a device which would save labor, economize time, cheapen production and perhaps improve the quality and appearance of an article in quite common use, and the practical development of the thought brought him into prominence as a manufacturer of specialties, and perhaps in time made him wealthy, but to-day such opportunities are few. The ground has been pretty thoroughly covered.

Mechanical talent at this time seems to be turning in a totally different direction. The capabilities of machinery having been very thoroughly developed and oppor-

tunities for new applications being discouragingly rare, the most notable achievements making seem to be in the direction of cheapening the production of staple articles. This is the keynote of the manufacturers who are now most successful. The search for specialties is not alluring, as specialty competes with specialty, and consumption is perforce limited. In staple articles, however, there is a constant trade. The manufacturer, therefore, who surpasses his fellows in the cheapness with which he can turn out staple articles of equal quality surpasses them also in securing a large share of the trade and better profits. Never before has mechanical genius so applied itself in this country as now to the solution of the question, how shall the cost of production be further decreased by the introduction of more efficient machinery?

Steel Goods Under Special Labels.

WE ARE in receipt of a letter from the W. Bingham Company, Cleveland, Ohio, referring to the above matter and taking exception to a paragraph in our last issue relating to Steel Goods under special labels. They advise us that they are selling these goods under their own labels and that they are not in the habit of letting their name go on goods of second quality. They refer to the fact that manufacturers who are members of a combination, the object of which is to keep up the prices of Steel Goods, are in the habit of characterizing goods made by those who do not join them as being of "second quality, made of inferior stock," &c. Our correspondents state that having handled combination goods for a long time with little or no profit to themselves they concluded to sell goods in future under their own brand and name and not be subjected to the dictation of the associated makers. They then add:

All we have to say to those who have bought our goods is to compare them upon receipt, and if they can see why they should pay from 10 to 15 per cent. more for the Steel Goods of certain manufacturers because they have the manufacturers' label on any more than they would for Axes, Shovels or many other goods that are sold under special labels, we would be very glad to have them do so and would be willing to pay for the information.

Destruction of Fred. J. Meyers Mfg. Company's Plant.

THE ENTIRE ESTABLISHMENT of the Fred. J. Meyers Mfg. Company, Covington, Ky., manufacturers of Architectural Iron Work, Wire Goods, Hardware specialties, &c., a large six-story brick structure, was completely destroyed by fire on March 5, the loss aggregating upward of \$220,000, upon which insurance was carried amounting to \$83,000, the greater proportion of the loss being sustained in the Architectural Iron Work department, as the material for several large Government contracts had been just completed and was ready for shipment. The fire at this time was particularly inopportune, as the company had sufficient contracts for Architectural Iron work on hand to keep them busy the entire year

and were full of orders for their specialties; to say nothing of large stock finished on hand in Wire Goods, Flour Sifters, &c. Immediate steps have been taken to secure temporary quarters for the company's different departments, and it is hoped that within a week or two they will be enabled to fill orders promptly. In the interval work will be commenced upon the ruins and new and larger buildings erected thereon as soon as possible.

Bicycles.

A NOTICEABLE FEATURE of 1893 Bicycle catalogues is the handsomely artistic manner in which many of them are gotten up. This is apparent not only in the covers and quality of paper used, but also in tinted pages, illustrations and artistic side sketches scattered through the books. Apt quotations from poets, illumined headings, interior views of office and factory, enticing roadside scenes and other features of like nature enliven pages which otherwise might not be so interesting.

W. BINGHAM COMPANY, Cleveland, Ohio, issue a catalogue of Bicycles, Sociables and sundries. The company control the entire product of the Hackney Bicycle Company, Cleveland, Ohio, the Yost Mfg. Company, Toledo, Ohio, and the Euclid Sociable. In opening their new Bicycle department they present a catalogue of artistic merit, finely illustrated and calculate to inspire a desire to own a wheel. The wheels shown are referred to as all new, not only in being newly before the public, but essentially modern in every particular, and are as follows: 1893 Hackney, Ladies' Hackney, Euclid Sociable, Falcon No. 1, Falconess, Falcon Jr. and Falcon Jr. combined. A large line of sundries are shown. Upon all kinds of supplies used by riders, the company state, they are headquarters.

E. C. STEARNS & Co., Syracuse, N. Y., send a handsome catalogue with light-colored embossed covers; the paper, illustrations and typographical work being of uniform merit throughout. Their line of Wheels include the Stearns Racer, model A, model B and model C. Illustrations and descriptions of the wheels are given, also cuts of the various parts of the machines in detail.

THE CATALOGUE of the Monarch Cycle Company, Chicago, has tinted covers printed in colors; upon the front cover their trade-mark, a lion's head in a Cycle wheel, is shown. The back cover illustrates their factory at 42-52 N. Halsted street. Upon an inside page are photographic reproductions of the officers of the company. Their Wheels are the Monarch Road Racer; Roadster model A; Roadster model B, and Lady's Monarch. Illustrations of a line of Bicycle accessories are also illustrated.

THE MCINTOSH, HUNTINGTON COMPANY, Cleveland, Ohio, issue a catalogue of Sunol Bicycles, with the front cover illumined in gold and blue. These machines are manufactured in this country at the factory of the company in Chicago. The first pages of the book are given to illustrating and describing the various parts of the wheel, followed by illustrations of the Sunol Racer, Light Roadster. Full Roadster, Lady's Sunol and Sunol 1892 pattern. For medium-grade wheels are shown the Hercules, diamond frame, in 30, 26 and 24 inch wheels; the Stella convertible frame 28 and 26 inch wheels. Cheaper machines include the Wizard and Cinderella, also Fairy Tricycles.

BUFFALO WHEEL COMPANY, Buffalo, N. Y., are offering for 1893 the Niagara Roadster, 38 pounds all on; Semi-Racer, 27 pounds; Racer, 24 pounds, and Maid of the Mist, 36 pounds, all on. Their special racing wheel, it is stated, is built to order only, and to reach, and is made especially light.

How to Avoid the Accumulation of Dead Stock.

FIRST ARTICLE.

BY H. P. TOWNLEY.

WE HAVE BEEN 20 years in business wrestling with dead stock, and we are pleased to give you an account of the numerous plans and schemes whereby it was made to go. During these years we have bought four stocks of goods from assignees and have thus gotten more of the stuff than we would otherwise have had. Our experience has been that it is not desirable to buy goods in large quantities in order to obtain low prices. The greater advantage lies in having the goods come to the shelves fresh, in having less capital invested and in being able to take the cash discounts.

CARE IN BUYING.

We endeavor to buy carefully and judiciously (especially if the article is new to us and no demand yet established) and thus feel the trade. Should it prove a seller the orner can easily be duplicated.

ANNUAL INVENTORY.

We take an annual inventory, which we consider very important as it brings into view all stock both good and bad. From this inventory we make list of all dead stock. The list with its quantity and cost price is put on heavy cardboard and tacked up in our office, reversing the maxim "Out of sight, out of mind." Thus we have the dead stock in daily view and by keeping everlastingly at it we succeed in getting well rid of it.

SLAUGHTER SALES.

We have on several occasions advertised "Slaughter sales—great reduction in prices at close of the season." This has never been successful with us. We prefer to carry such goods over to another season and yet get the profit on them when they are sold. Slaughtering prices will demoralize the trade of other dealers as well as our own.

INTRODUCING GOODS.

Small articles are put in the most conspicuous place in the store, namely, on the showcase or on a table near the door, with plain tags on them and our clerks instructed to call the attention of every one who enters the store to them whether customers or not.

JOB LOTS.

We frequently make up job lots for second-hand dealers. We will lay on the floor a pile of goods of which one-half is dead stock and one-half good—the good being put in for a bait. We then call in our two-handed brethren and work them for \$3 or \$5 for the lot, as the case may be. One year we sold a gross or more old, old lanterns which would hardly pay their own drayage.

PREMIUMS.

We have used the "PM" system (PM being abbreviation for premium). Each article is marked with a peculiar tag. As the article is sold the clerk keeps the tag till the end of the month, when the cashier will redeem it at the agreed price, the PM money being over and above his

salary. We have known clerks to earn \$3 to \$4 per week extra in premiums.

PRIZES.

To crowd the sales of Stoves we have offered three prizes—viz., \$20, \$10 and \$5—to the clerks who would sell the greatest number, up to January 1.

CONSIGNMENT.

One year we were carrying 13 hard-coal Base Burners which we had taken back on trades. As this is a great soft-coal country these Base Burners were likely to become stickers. We shipped them to a commission auction house in Chicago. After paying freight and liberal commission we came out ahead.

DAILY REDUCTIONS.

Another year we used the 50-cent reduction plan.

The following placard was put on a Stove on the sidewalk.

GREAT SCOTT!!

This Stove will be reduced

fifty cents each day

until sold.

Price to-day, \$12.50.

The cost price on the first Stove experimented on was \$8. A customer was ready for it bright and early on the day it was marked to be sold for \$8.50. The record of 20 of these sales shows that we came out a little above cost. With each Stove extra pipe, tinware, &c., was sold.

COUNTY FAIR PREMIUMS.

Our county fair has helped us to run off some Patent Bread Cutters and Patent Washing Machines by offering them as special premiums for the best layer cake or the largest pumpkin, the cake to go to the dealer. We considered this scheme successful on account of the advertisement there was in it.

Louisville Trade.

(From a Special Correspondent.)

THE HARDWARE TRADE of Louisville, Ky., is enjoying one of the best seasons ever known, as regards quantity of goods going out. All forces are busy and keep going far into the night getting off orders. Prices have stiffened just enough from the manufacturers to make the jobbers feel some backbone and independence, and yet does not lead into speculation. If manufacturers of Wire and Nails will be able to maintain what advance they have made, it will accomplish a great deal for the trade generally, besides their own benefits.

There is no trouble, now, for the jobbers' salesmen to take all the orders they want, and as a general thing collections are very fair, causing little to worry about.

There is one thing proved: the production of staple Hardware goods is just about equal to demand when the latter is at its highest point, as at present. All the mills and factories are working full; the jobbers are receiving and shipping out goods just as fast as they can be handled. There is no accumulation at

the mills, the pig iron furnaces are running smoothly and everybody is well satisfied.

The great and only trouble to our big country is that when the heavy consumptive demand slackens the production keeps on the same, and then comes the price cutting. "Supply and demand will regulate themselves," is a common maxim—too common. Demand is all right, it keeps itself well regulated, but supply is the wicked spirit that won't down.

Trade Items.

JAMES R. NUTTING of the Sickels, Preston & Nutting Company, Davenport, Iowa, who came East largely to attend the recent Hardware dinner, expressed himself as greatly pleased with the entertainment provided by the committees who had the matter in charge. He has returned, going by way of Washington to attend to some matters in that city.

THOMAS B. KENT of the Holmes, Booth & Haydens Company, who was made their president at the last annual meeting, January 26, 1893, was unanimously elected a member of the New York Chamber of Commerce on the presentation of his name by Henry Hentz, chairman of the Executive Committee, at the regular monthly meeting, March 2.

THE FORD HARDWARE COMPANY have been organized at Washington C. H., Ohio, by James and William S. Ford. James Ford was formerly a member of the Brown & Ford Hardware Company. The new firm were fully established on March 1, and are handling a line comprising Hardware, Farm Implements, Blacksmith's Supplies, Mantels, Grates, Paints, &c.

THE HARDWARE FIRM OF CASH & BRADFORD, Hyannis, Mass., have been dissolved, Mr. Cash retiring after having been in business since 1866. Mr. Bradford, who has been associated with Mr. Cash for the past seven years, will continue the business in a part of the new block soon to be erected on the site of the one which was recently destroyed by fire. The new block will be four stories high on Main street and will cover 8000 feet of land. Mr. Cash will for the present devote his attention to building matters.

F. H. EWALT, J. E. COOPER AND C. C. EWALT have organized at Manhattan, Kan., the firm of Ewalt, Cooper & Co. The new firm will commence business about March 15, and will carry a line of Builders' Hardware, Cutlery and general Hardware. Plumbing will also be a part of their business. The new firm will be pleased to receive catalogues and other printed matter issued by manufacturers and jobbers in their line.

AT THE ANNUAL MEETING of the Albany Hardware & Iron Company, Albany, N. Y., recently held, the officers for the past year were re-elected—namely: Charles H. Turner, president; James K. Dunscomb, treasurer, and William B. Wackerhagen, secretary.

THE JOHN D. SAWYER COMPANY (corporation), Pawtucket, R. I., have purchased all the partnership rights and assets of the firm of John D. Sawyer & Co., and will continue the business at 296 Main street.

THE FIRM of Kirkwood & Bassett, Hardware dealers, located at 21 Federal street, Allegheny, Pa., has been dissolved, and has been succeeded by the Allegheny Hardware Company, Limited. The new concern will carry a full stock of Builders' Hardware, Cutlery, Tools, &c., and will also carry a special line of sporting goods. R. L. Kirkwood is secretary and treasurer of the new concern.

JOHN HENKELL, 531 Liberty street, Pittsburgh, Pa., dealer in Seeds and

Agricultural Implements, and agents for the Pittsburgh district for the Oliver Chilled Plow Company of South Bend, Ind., has just completed the erection of a four-story building at 421 Ferry street, Pittsburgh, and is now moving into the same. Mr. Henkel was located at the first-named address for many years, and is one of the oldest dealers in his line of business in Pittsburgh.

LITTLETON R. SNEED, eldest son of W. T. Sneed of the Hardware firm of W. T. Sneed & Bro., Gordonsville, Va., died of consumption on February 27 in the 20th year of his age. The deceased had been in poor health for some time and was for weeks unable to sit up, so that his death was not unexpected. His life was only prolonged by the aid of efficient medical skill, careful nursing, &c. He was well and favorably known to a good many traveling salesmen having business relations with the firm of which his father is a member.

WE ARE ADVISED that the handsome calendar issued by the Sercombe-Bolte Mfg. Company, Milwaukee, Wis., is being much sought after by the trade and Bicyclists. The feature of the Calendar is a reproduction in large size of "The Four-leaved Clover." These Calendars can be obtained on application until the supply is exhausted.

SWANN, WHITEHEAD & CLARK, lately incorporated in the new concern called the American Lamp & Brass Company, announce their sample room now at 96 Church street will be abandoned May 1, and the goods in future shown at 43-45 College place, now occupied by the Clark Bros. Lamp, Brass & Copper Company, another of the three interests absorbed in the late consolidation. The quarters in College place will be enlarged by the taking in of a portion of the building at No. 45, which will be remodeled so as to have twice the floor space now used. The partition wall between the two buildings will be broken through and a large sales-room provided.

SYRACUSE SPECIALTY MFG. COMPANY, Syracuse, N. Y., manufacturers of Rakes and a line of Hardware specialties, have appointed Surpluss, Dunn & Alder, 97 Chambers street, New York, agents for the sale of these goods.

Travelers' Samples Not Baggage.

A DECISION of very general interest to manufacturers and others affected was recently handed down by the Supreme Court of New York, in connection with the responsibility of railway companies in the matter of samples carried by commercial travelers. The gist of the decision is that the ordinary contract of a railroad company or other common carrier of persons is to transport them and a certain amount of their personal baggage, and not the merchandise of other people. Samples of merchandise contained in the trunks of commercial travelers, and belonging to their employers, do not constitute a part of their legitimate baggage. Consequently where such samples are checked as baggage over lines on which passage is taken, and especially as the baggage of the commercial agents, no recovery can be had for their loss. Nor does the mere fact that an excess baggage charge on extra weight is demanded and paid and the fact that the baggage agents are informed that the trunks checked contain samples change this. Though if the carrier undertakes, by express or implied contract, to carry other people's merchandise as freight, they are liable as any common carrier of freight

would be, and that is all; and such facts must appear from which it can be reasonably inferred that this contract of affreightment was entered into with knowledge of all the facts.

In commenting upon the case, a leading railway journal remarks:

"If, as it appears by the decision, a railroad is not responsible for commercial travelers' samples as baggage, there will be an immediate and urgent need of providing for some arrangement under which these samples may be carried. There is no doubt but that our system of baggage transportation has been so misused by commercial travelers as to amount to a veritable abuse, and it is just possible that in view of the decision railways may find it to their advantage to refuse to longer engage in what actually amounts to express business and refer commercial travelers to such companies for the transportation of their sample cases which, in many instances, exceed a thousand pounds per traveler."

That there is much justice in these remarks will be acknowledged. At the same time it is their obvious duty to make such arrangements that a commercial traveler may be able to accompany his sample cases, which it is often undesirable to consign to the care of express companies on account of delays, not to speak of the heavy charges imposed by those carriers.

World's Fair Hotel.

R. W. MONTROSS, manufacturer of specialties at Galien, Mich., and H. W. Coolidge, who has been identified with the wholesale Hardware trade at Chicago for 20 years, will conduct a hotel on the European plan, named the Audubon, on Oglesby avenue, near Midway Plaisance, only four blocks from the main entrance to the World's Fair. These gentlemen first conceived the idea of entertaining their own friends and customers, so as to supply them with inexpensive but good accommodations, but afterward decided to increase the scope of their plan. The scale of prices may be of interest. One-half of the house, containing 50 rooms, is rented by the room at \$3 to \$6 per day per room, while the other half is rated per person at from \$1 to \$2 per day. These rates are subject to change as the season advances, and of course do not include meals. A *café* will be conducted in the hotel for the convenience of the patrons. The proprietors require reference from applicants not personally known to them who make advance engagements. The hotel will be directly under the management of N. H. Henchman, Jr., an experienced and widely known hotel manager. Souvenir catalogues and further information can be obtained by addressing Montross & Coolidge, Room 1433 Masonic Temple, Chicago.

We are advised that Wm. J. Lloyd Mfg. Company, Philadelphia, have discontinued the manufacture of the Great American Meat Cutter and that everything pertaining thereto has been purchased by the Enterprise Mfg. Company of Pennsylvania.

The Penn Tack Company of Norristown, Pa., have been granted a charter, with a capital of \$25,000. Among the directors are Wm. N. Easton and Harry J. Weiner of Pittsburgh.

Averages on Wire Nails.

SOME CRITICISM has been made on the action of the manufacturers of Cut Nails in adopting the Wire-Nail card, inasmuch as they agree to make it the basis of transactions without reference to average on "ordinary assortments," and at the same time specify that no order will be considered assorted unless it averaged as high as 10d Nails, or 50 cents a keg above base. This qualifying clause has been referred to as contradicting their position that quotations are to be made without reference to average, and has been brought up as an objection to their plan.

In this connection, however, it should be borne in mind that while Wire Nails are often referred to as sold without regard to average and so quoted, there is a disposition on the part of the mills to require more or less explicitly a satisfactory average on their orders. This average is not usually specifically mentioned, but there seems to be an understanding that orders to be entitled to the lowest ruling base prices shall average from 50 to 55 cents above base. The usage of some of the mills when large Nails with a considerably lower average are ordered is to charge a higher base price, but others, where such orders are received from customers to whom a general line is in the course of trade regularly supplied, advise us that they fill such low-average orders at regular base price, expecting that the matter will be equalized in the regular course of business. While there is not entire uniformity of action among the different manufacturers of Wire Nails on this point, there is an evident tendency toward insisting that orders shall have a fair average in order to be entitled to the lowest prices. The close competition which has characterized the market for some time has naturally brought about this condition of things, especially as cases are known where large buyers have divided their orders and have endeavored to place the larger Nails with low average at market rates, and on the rest of the order with high average to obtain a low base price. In order to discourage proceedings of this kind the manufacturers have found it necessary to insist on a fair average as above mentioned.

In order to place the matter before the trade in the way in which it is viewed by the manufacturers, we give below some extracts from letters recently received from them in which they touch upon this point. One of the largest Wire-Nail manufacturers in this country states specifically as follows:

A fair average advance for Wire Nails is considered to be not less than 55 cents over the base. If a party asks us for a price on a car lot of Nails, we insist on a 55-cent average, which is the regular Hardware specification.

Another prominent company who have perhaps, been least disposed to insist on averages refer to their position and the tendency of the trade in the following terms:

The usage of Wire-Nail manufacturers in regard to averages has been to take what the trade specifies, but of late one or two of our competitors have insisted

upon an average, the base price being so low that they could not get out even unless they had 65 cents above base. We, ourselves, have never insisted upon an average, but we have always quoted on assorted specifications, and this has resulted in our getting as good an average as those people that insisted upon a special one.

The average of the Wire-Nail business is, according to location, 55 to 65 cents, and 60 cents can properly be regarded as the average of the country. Of course, any one wanting a straight carload of 10d, 20d or 30d, without having a contract with us for more Nails, so that by specifying later on the average would come up to what we want, would have to pay an extra price for large Nails.

Another manufacturing concern states that the question of extras on Wire Nails is of the highest importance, and after alluding to the fact that the base on Wire Nails has for a long time been below the cost of rods, discusses the question in this way:

It goes without saying, therefore, that no sensible man would fill an order for base sizes, nor even for such sizes which carry small extras only. Again, the buyer of small sizes exclusively is aware that he is paying a portion of the loss that is made on large sizes, and, therefore, holds out his order as a bait to get a low base quotation. It is certainly very difficult to determine exactly what each Nail costs, and the manufacturer ought to be content to receive a certain average for the whole year per ton of nails manufactured. The total average must be sufficiently in excess of the average cost of rods to allow for manufacturing the goods. This is really all one cares for, yet it is manifestly insane to sell any Nail knowingly at a loss. No language can sufficiently denounce the absurdity of selling a 60d Nail at \$1.30, keged and freighted, when the raw material to the average point of delivery costs without any handling whatsoever \$1.40 or \$1.45. We absolutely challenge any manufacturer to gainsay the assertion that the average extra, equal to that of a 10d Nail, will, under such conditions, pay the expenses of manufacturing and leave a profit. The dealer in Wire Nails does not need to care. He buys his Nails, and his profit is a fixed addition to the base at which he bought. He sells, therefore, any quantity of 60d Nails from his store at his own price, say 10 or 15 cents above the established rates, and the buyer of such goods receives them below the cost of production, perhaps even below the cost of the raw material that has entered into them. So long as we received a base price which covered the manufacture of large-sized Nails the question of average was not so important. To-day, we would not fill an order of large-sized Nails only.

The difference of usage among the manufacturers is referred to in the following letter from another well-known company:

We are inclined to think the Wire-Nail manufacturers do not all treat the subject of average in the same way, some believing that the average will take care of itself, while others demand that the average advance must not be less than so much. In the cost of Nails we estimate that the average should not be less than 60 cents over base. When a specification is submitted for an assortment of 20d, 30d and 40d Nails, we quote the same price for all sizes, making an average advance for the order of say 50 cents, 55 cents or 60 cents over base.

Substantially the same position is taken also in the following letter:

While it is not our practice to consider the question of averages in quoting on Wire Nails, we usually stipulate that assortment shall be an average one, expecting that such an assortment shall average 50 to 55 cents

above the base, and where lots of large size exclusively are wanted we usually quote special price. This we think is about the custom of other manufacturers as well as ours.

It will thus be seen that there is substantial agreement among the manufacturers on this point, and it should, therefore, be borne in mind that any exceptions that may be taken to the action of the Cut-Nail Manufacturers in this matter applies with equal force to Wire Nails.

San Francisco Trade.

THE FOLLOWING REPORT of the business of San Francisco in Hardware and Metals during the past year is from the *Commercial Herald* of that city:

The year in Hardware was not an especially active one, as far as trade in Eastern goods was concerned. That, of course, was caused by the general quietude of business, the lessened amount of building, &c. It may, however, be questioned whether the lessened sales were not paralleled in every State in the Union; nay, in almost every part of the world, as the same causes that prevailed here have made their influence felt elsewhere. During about three months of the fall there was a reasonably good trade. The receipts by rail were smaller than in 1891, partly on account of the prevailing quietude, partly because the starting of the clipper lines with freights down to \$5 to \$8 per ton drew a great volume of shipments that way. There was more Hardware imported by sea than for many a long day previous. On the whole the market was not active. There was a moderate business done during the year, but it did not come up to expectation, and there was even talk of one or two of the leading houses closing up business. The shipment of goods by leading firms from New York to Europe and thence to San Francisco was stopped by the Government, but taken into the courts, and there after a considerable time it was decided that owing to the fact of shipments this way, via the British-American provinces being prohibited by special enactment, it required a special enactment to do the same in respect to shipments via European ports. This was a triumph for the merchants, but on account of the cheap shipments via clipper this method was abandoned. The year closes with good prospects for 1893.

Sales for 1892:

Agricultural Implements.....	\$2,500,000
Iron and Steel	5,500,000
Hardware	1,500,000
Tin Plate.....	2,300,000
Quicksilver.....	1,000,000
Wire and Wire Goods	1,500,000
Nails	650,000
Various	1,000,000
Pig Tin.....	500,000
Total.....	\$16,450,000

Home Nails.

THE ATLAS TACK CORPORATION, Boston, have added to their line of home goods Wire Nails of assorted sizes, put up for the retail trade in colored lithographed boxes, similar to those of Home Tacks, as illustrated in *The Iron Age*, March 2. These are known as Home Nails, and contain assortments of Wire Nails from $\frac{3}{8}$ inches to $3\frac{1}{4}$ inches in length, designed to supply the requirements for all repairing in and about the home.

THE BUSINESS formerly conducted by Murphy, Cole & Bain, retailers of Hardware, Tinware, Stoves, &c., Bethany, Mo., is now carried on under the style of J. L. Cole & Son.

After Mexican Trade.

BY WM. H. MAHER, TOLEDO, OHIO.

THE FOLLOWING LETTER from an experienced Hardwareman, who has recently visited Mexico in connection with a number of manufacturers under the auspices of the Australasian Publishing Company, will be of special interest as giving a view of the condition of trade in that country in the lines to which *The Iron Age* is devoted. Referring to the fact that the party were down in Mexico to investigate Mexican trade and were very soon to learn whether there was any trade there for them or not, Mr. Maher continues:

First, we learned that very few, if any, dealers were handling but one line of goods: the stores seemed to carry mixed stocks. Interpreters and the leaders of the party went into a store, stated in their own way the mission of our party, presented us individually to the proprietor, and then we were permitted to roam about the room, look at labels and ask questions.

The courtesy of the Spaniard and Mexican was apparent at the outset. Those who read this are merchants, and may ask themselves how they would like to see from 20 to 40 foreign manufacturers come into their store, go among the stock, examine packages for labels and names, and ask questions as to the goods. My opinion is that they would look upon it as a somewhat impertinent proceeding, or be bored by it.

But our Mexican hosts followed some of us, let us go as we pleased, assured us that we were welcome to everything in the place, and to their time, and never once appeared to be insincere.

I am writing this for the Hardware trade, but I am confident the members of that trade will be interested, as I was, in everything connected with American goods, and my notebook shows all American labels I came across, no matter what the line of goods they were on.

The first item that met my eyes in the first store that we entered was a box of Axes. It was like meeting an old friend, though the label was not one with which I was familiar. The pattern was the old square poll Dayton, and was one long out of date in my section. The label bore the marks "Royal Axes," and "Penn Axe Company, Harrisburg, Pa." The weight was that familiar assortment $3\frac{1}{2}$ to $4\frac{1}{2}$ pounds. I was told that the Axes were wholesaled at \$12 per dozen, and retailed at \$1.25. (See note as to Mexican money at foot of this letter.)

Passing along the counter I saw Coffee Mills from Lane Bros., Tacks and Shoe Nails of Dunbar, Hobart & Whidden's make, Axle Grease from Waters, Pierce & Co., the "J. Thomas" Shovels, Copper Rivets from Wallace & Sons, Wire Nails in pound packages from both Pittsburgh Wire Nail Company and the Brooklyn Nail Company.

Then we seemed to reach a miscellaneous department, and there was a large stock of calcined magnesias from Keasby & Mattison, Ambler, Pa.; Duryea's starch, Perrin's sauce, lamp wicks from Fletcher Mfg. Company, Providence, R. I.; Staf-

ford's inks, David's ink, and cove oysters from Ludington & Co., Baltimore.

By this time we had again reached a Hardware counter, and the most prominent goods there were two or three dozen of Collins & Co.'s Machetes. Nearby were some Hatchets from R. King, Canton, Conn., and I was interested in seeing a No. 1 (in size) Shingling Hatchet sold for \$1. The Collins Machete sold at \$11 per dozen; \$1.50 each. Not far away was a large Coffee Mill, for store or hacienda use, made by Carr & Hobson, New York, and some Glassware near that was branded on the case as having been made by the Missouri Glass Company of St. Louis. I was glad to see that the West was "in it."

Following along I came to a sample card of common Pocket Knives; they were stamped "Star and Crescent" and were undoubtedly German manufacture. A common two blade Knife that used to cost us \$1.60 per dozen was retailed here at 88 cents. I think the clerk said they bought them of Rice, Born & Co., New Orleans, but neither his English nor my Mexican was extensive enough to make me sure of anything he told me. I knew what he said, but I was not aware of what he meant; so we smiled at each other, as if we both understood what that meant.

Winchester Cartridges looked down upon me, as if they remembered me of old. I was told that the 22-caliber rim-fire Cartridge retailed at \$1 per 100, and I was sorry I hadn't been able to get that price during my Hardware days. I met Fairbank's Scales in every department of the store, and afterward at almost every railroad station.

Passing into another general store I, of course, looked for Hardware, and Hatchets branded "Crescent Tool Company, New Orleans," met me at the outset. Then some German card Scissors, something I have not seen before for 20 years, came to view, and took me back to the days of Lau & Garlich and Hilger & Sons. They were such Scissors as used to sell for \$1.50 per card, and were retailed up North at 25 to 35 cents; they sell here at 75 cents.

Near the Hardware was a large stock of Lead Pencils from the American Lead Pencil Company, and not far away was a large Herring's Safe. As I stood there I watched the clerk sell some common cotton cloth to a woman, and I was amazed to see him ask 15 cents per yard, and get it. On the wall were a few very common Hand Saws, made in Remscheid, but I was told that the Diston Saw was well known and a favorite with carpenters. In the store room were Churns made by the Ames Plow Company, Feed Cutters from Belcher & Taylor, Chicopee, Mass., Oliver Plows from South Bend, Ind., Peter Wright's Anvils, and I am told no other are sold in Mexico.

The proprietor was evidently a man without prejudices, for he not only had a large variety of American-made goods on hand, but he produced from a very cool cellar some fine Milwaukee beer, and persuaded us to join him in a toast to the two republics.

Our next call was at the headquarters of the Sonora News Company. The

young man in charge, Mr. Peters, is from Goshen, Ind. He had a fine stock of Pocket Cutlery and Razors on hand, all from the Electric Cutlery Company of New York.

At 12 o'clock, noon, business in Mexico practically ceases until 3 o'clock. Men go home to what they call breakfast and take a little nap, or siesta. When we went out again at 3 o'clock, the first store I examined was carrying a good stock of Loring & Parks' Tacks. The Shoe Knives in the showcase were made by W. & S. Butcher; Pressed Ware was from the St. Louis Stamping Company, and there is now all through Mexico a good demand for 10, 12 and 14 quart galvanized Water Pails.

At another department canned goods from Portland, Ore., were prominent, and not far away Brainerd & Armstrong's sewing silk took up a good deal of space. The candle trade must be very large here and the Emery Candle Company of Cincinnati, Ohio, seemed to have most of the trade. Canned meats from the Armour Packing Company; lunch tongue from A. Weber & Co., St. Louis, and goods from the New York Condensed Milk Company, kept up the credit of the United States in this establishment.

It may strike you as a queer combination, but one counter had a large display of Axes branded, "Crescent Tool Company, New Orleans," and the Royal Baking Powder side by side. Keagle & Ginder, Baltimore, were represented by canned goods, and the Globe Pickle Company of St. Louis had its goods here, which interested our friend Heinz of Pittsburgh, who is in that line. New Orleans had sent biscuits here, L. Pickert & Co. of Boston, canned fish, and here was to be found "Sapolio."

Speaking to the dry goods clerk, he told me (what others say will not prove true further South) that the common grade of dry goods sold here all came from the United States, but the better grades are from Germany and England.

In an agricultural room I saw quite a stock of Chattanooga Plows, and in several places in the city are Windmills made by Mast, Foss & Co. of Springfield, Ohio.

There is a good iron foundry in Monterey, and you will be interested in knowing that the wages of unskilled labor are $37\frac{1}{2}$ cents per day. Wages of all kinds are low, and with this in mind read these items as to the selling prices of familiar goods:

I wanted a dozen 2-grain quinine pills; price was 50 cents. Colgate's Cashmere Bouquet soap, 25-cent size, sells here for 60 cents. Hoyt's German cologne, 20-cent size, price here is 50 cents. Brown's shoe dressing, 10-cent size in United States, retails in Monterey at 45 cents. Flour retails at \$2 for 25 pounds; potatoes, 8 cents per pound.

These prices may seem fearfully high, but Mexico is a "tariff for revenue" nation, and the consumers must pay the tax, as there is no home competition. The duties on merchandise are very high, as is also freight. For instance, a gross of shoe dressing costing \$5 in New York will cost \$11, laid down, in Monterey. The Mason blacking, \$2.25 gross size, is

jobbed here at \$7.80. Landman's Florida water, \$2.75 dozen in New York, is said to cost here, duty and freight paid, \$8.75 per dozen. It is sold at wholesale at \$12 dozen and retail at \$1.50 here, as against 60 cents in New York.

NOTE.—When we crossed the American border we found that the United States dollar would buy \$1.54 of Mexican money. In considering the selling prices of goods in Mexico this should be borne in mind, and it will be seen that Mexican prices are not so high as they seem. Yet the Mexican workman is paid in Mexican money, so the price, to him, is exactly what it appears to be—almost out of reach.

The Lalance & Grosjean Mfg. Company's New Mill.

WEDNESDAY, the 22d ult., was fitly celebrated in all parts of the country. Among the events which marked the anniversary of Washington's birth, not the least noteworthy was the formal opening of the new rolling mill which the Lalance & Grosjean Mfg. Company of Woodhaven, L. I., have erected at Harrisburg, Pa. The rolling mill, which is among the most complete establishments of its kind, is destined for the production of light sheet iron to be used in the manufacture of the enameled ware and domestic utensils for which the concern have long been famous. It will yield an output of from 250 to 300 tons of 24 to 26 wire gauge sheets weekly, the bulk of which will be consumed by the Long Island factory. The sheets will also be cut into the desired patterns at the Harrisburg mill, ready for stamping and finishing at the company's main establishment, thus greatly expediting the manufacture and augmenting the capacity of the concern, while relieving the factory of the handling of scrap, which has hitherto been a great drawback there.

The new mill is situated in a lot of 12½ acres, which the company secured in West Harrisburg. It possesses great advantages of location, being on the line of the Pennsylvania Railroad, and in close vicinity to the coal and iron regions of Pennsylvania.

ADDITIONS TO FOLLOW.

The works were commenced early last summer under the supervision of J. J. Thomas, who remains as superintendent, while J. P. Luce, assistant manager, will have charge of the clerical and business part of the new establishment. The firm's engineer, J. B. Barrody, has had charge of the erection of the mill, and we understand that he is now engaged upon plans for extensions, which will be shortly carried out. The additions contemplated are a second building for making tin plates, for home use by the company, and a third structure in which will be manufactured "black iron goods," as distinct from the coated ware made at Woodhaven.

OPENING EXERCISES.

The officers of the Lalance & Grosjean Company are: Florian Grosjean, president; Augustus J. Cordier, vice-president; and E. W. Martin, secretary and treasurer.

As previously stated, the mill was started on the afternoon of Wednesday,

February 22. Special cars attached to the Pennsylvania express conveyed President Grosjean and the members of the company's staff and their families, together with several guests, from New York to Harrisburg, where on arrival they were met by a number of prominent citizens of that place, who accompanied the party to the mill. The opening ceremony was simple and brief, consisting in the starting of the machinery by the little son and daughter of Vice-President Cordier. On their pressing a lever which released attached weights the busy wheels and engines were instantaneously set into play all over the building. After thorough inspection of the plant a banquet was spread in the mill, to which the firm and their guests, all the employees of the mill and a number of visitors from Harrisburg and its vicinity were invited. A brief address of hearty welcome to the city was made by M. W. McAlarney, editor of the Harrisburg *Telegraph*, and responded to by George L. Nichols, Jr., one of the directors of the company, on behalf of the venerable president, Mr. Grosjean. Among the visitors who accompanied the New York party were: F. G. Niedringhaus and E. B. Brown of the St. Louis Stamping Company; A. M. Brush of Holbrook, Merrill & Stetson, San Francisco, Cal.; H. A. Manning of Manning, Bowman & Co., Meriden, Conn.; Charles X. Cordier of Waterbury Brass Company; H. V. B. Nash of T. B. Codding & Co., New York. In addition to President Grosjean, Vice-President Cordier and Messrs. J. H. Smith and Geo. L. Nichols, Jr., directors of the company, occupied the position of hosts.

American Hardware in Denmark and Scandinavia.

WE ARE INDEBTED to a well-known house in Copenhagen who handle American Hardware to some extent for the following communication in regard to the sale of American Hardware in Denmark, Scandinavia and Russia. The information given will be appreciated by the increasing number of American manufacturers who are interested in foreign trade:

Denmark is not the "gate of the Continent," but the "gate of Scandinavia and Finland," and to some extent also of the Russian provinces bordering the Baltic. A large free harbor, a model of which will be exhibited at the World's Columbian Exhibition, is under construction and will be opened in 1894, probably partly this year.

The natural position of Copenhagen, the Danish metropolis, in connection with the new free harbor, will, no doubt, in a higher degree than heretofore, make Denmark the "gate of Scandinavia and the Baltic provinces," especially as with the opening of the free harbor all harbor dues are to be abolished in order to facilitate international commercial intercourse.

The Thingvalla Steamship Company's steamers are frequently plying between New York and Copenhagen, and the rates for Hardware are cheap.

From Copenhagen the United Steamship Company's (of Copenhagen) steam-

ers go in regular routes to all seaports in Denmark and to all important seaports in Norway, Sweden, Finland and Russia. Besides their steamers go in regular service to England, Germany, Holland, Belgium, France, Portugal, Spain and the Mediterranean countries. That Copenhagen benefits greatly from this good steamship service is obvious.

Denmark being an agricultural country, she imports nearly all of what she needs in the way of Agricultural Implements and Hardware, and American goods have found a ready market here, which, no doubt, can be further developed when a more direct trade is promoted.

In Norway, whose chief sources of revenue are agriculture, fishery and navigation, American Hardware is extensively used.

Sweden is to some extent a manufacturing country, Swedish Iron and Steel being well renowned for its superior qualities, but she imports a good deal of Hardware from abroad.

Russia (we are only speaking of the Baltic provinces) is a good market for American Implements and Hardware, but the business must be carefully studied before you enter into transactions.

The import duty to Denmark is liberal, the duty for Hardware generally being a little more than \$3 per 100 kg. In Sweden and Norway it is varying.

Below we name a few lines which are imported from the United States:

Mowers and Reapers are sold to a great extent, and the sale is growing.

Plows.—The sale of these is increasing.

Augers, Bits, Axes, &c.—These articles are much sold, although the German and the English competition is very keen.

Mincing and Meat Chopping Machines.—Large quantities have been sold of these, the Enterprise being in front of all. The Enterprise you will find in every ironmonger's shop, even in the smallest.

Padlocks.—A good trade has been done in Yale's Patent and other good makes, also in cheaper qualities, the buyers having taken a fancy to American patterns with the small Keys. No doubt the business therein will improve further.

Saws and Files.—Herein the business might be extended.

Hay Forks.—These have been sold largely heretofore, but local makers are now taking the lead.

Wrenches.—Acme Wrenches have had a good sale; also other patterns.

Typewriters of various makes have been introduced.

Household Articles.—A great variety of these has found a ready market here and the consumption, which has been very large, is still increasing.

As said above, Denmark is an agricultural country, the main export articles being butter, cattle, pork, grain. White cabbage is about the only article we export to the U. S. A.

Besides these sources of revenue, a good trade has developed in Denmark, and the Danish merchants enjoy a high reputation, which may be said of all branches of the trade.

As to Hardware wholesale dealers, the general mode of payment here is strict cash. This is to be understood as 30 days from date of invoice, and draft to be sent through corresponding bankers in the different countries to be presented here for payment.

Prize Competitions

\$25.00.

FOR MORE than six months Weekly Prize Competitions (\$10) have been an interesting and useful feature of the *Pharmaceutical Record*, a journal issued from this office and devoted to the interests of the drug trade. These weekly competitions have related to a variety of technical and business questions of interest to druggists, and have brought out a large amount of information of much service to the readers of that enterprising journal. In view of the success of this feature we have decided to announce a similar series of Weekly Prize Competitions on questions of interest to our readers, and invite a general participation on the part of the trade. As the object of these competitions is to obtain information which will be of practical service to our readers, and to discuss questions in which they are interested, we shall esteem it a special favor if any in the trade will suggest subjects for such competitions, which, if deemed suitable, we shall take pleasure in using.

In each competition there will be three prizes—a first prize of \$12.50, a second prize of \$7.50 and a third prize of \$5. The prizes will be awarded for the answers which in the judgment of the committee of award are most suitable for publication and of the most general interest. We reserve the privilege of extending the time on any competition in case the contributions received are not of sufficient number or merit for the committee to award prizes. These competitions are open to every one, and it is hoped that there will be a general response from business men. We shall have the privilege of publishing any or all of the contributions received.

Prize Competition No. 15.

SUBJECT :

Suggestions in Regard to the Sale of Athletic and Sporting Goods.

In this competition athletic and sporting goods are regarded as including Baseball, Tennis, Football and Gymnastic Goods, Fishing Tackle, Bicycles, Guns, Revolvers, &c.

The object of the competition is to draw out from the trade information or suggestions in regard to the sale of this class of goods—how it may be increased and made profitable—especially in the smaller villages and towns.

Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers will be favorably regarded as meeting the purpose for which these competitions are announced.

Those discussing the subject are of course free to treat it as they think best, but the following points are suggested as deserving attention :

To what extent business in this line can be satisfactorily connected with general Hardware;
The kind of goods that can most advantageously be sold;
How the sale of these goods is to be increased;
Method of displaying in show windows or store;
What it is feasible to do in this line without carrying the goods in stock, sales being made from samples or catalogues.

The following prizes will be awarded :

First prize\$12.50
Second prize 7.50
Third prize 5.00

Replies are to be received not later than April 1, 1893. They should be addressed as follows :

DAVID WILLIAMS,

96-102 Reade street,

New York.

Prize Competition No. 15.

The committee to whom the contributions in Prize Competition No. 1 were referred have awarded the prizes as follows:

First Prize to H. P. TOWNLEY, Terre Haute, Ind.

Second Prize to H. C. WISEMAN, Springfield, Ohio.

Third Prize to W. T. WARSOP, Fairport, N. Y.

Other Competitions which have closed are now in the hands of the Committees of Award, who are giving careful attention to the claims of the different contributions. From the number of these and the evident merit of not a few of them, we are assured that a great deal of valuable information and suggestion will be put at the disposal of the trade.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 12. Closing March 11.

Arrangement of Pocket Cutlery.

No. 13. Closing March 18.

The Best Method of Changing a Credit into a Cash Business.

No. 14. Closing March 25.

Suggestions Regarding the Sale of Spring and Summer Goods.

No. 15. Closing April 1.

Suggestions in Regard to the Sale of Athletic and Sporting Goods.

Another subject will be announced in our next issue.

Manufacturing.

AT A MEETING of the stockholders of the Youngstown Stamping Company, whose affairs were recently placed in the hands of W. C. Hine, receiver, held at Youngstown last week, the following statement of the condition of the concern was presented :

Assets.	
Merchandise.....	\$32,131.35
Machinery.....	13,414.97
Fixtures.....	2,857.05
Real estate and buildings.....	22,000.00
Ledger accounts.....	10,499.13
Total.....	\$80,892.50
Liabilities.	
Bills payable.....	\$90,750.00
Acceptances.....	9,025.80
Ledger accounts.....	9,035.86
Pay roll.....	2,170.13
Total.....	\$110,981.79

It is stated that the above figures were

made up on the basis of actual values, and when anything of a questionable value came up it was not included. A committee was appointed to confer with the creditors of the concern and endeavor to devise some plan satisfactory to them by which the works can continue in operation.

W. H. Briggs & Sons, Valdosta, Ga., who commenced the manufacture of Hacks and other Turpentine Tools about two years ago, report their business rapidly increasing, especially since the first of the present year. These tools are referred to by them as positively the hardest edge tools to make successfully, and the manufacturers attribute their success to the fact that all of their setting, shaping and tempering is done by one man who has had large experience in this line. An illustrated catalogue describes these goods with list prices.

The Ludlow-Saylor Wire Company, St. Louis, Mo., report a large trade in their jobbing department, and have a number of good orders on hand for Ornamental Brass, Iron and Aluminum work. Among those recently secured is one for the grille work for handsome screens to be placed in the rooms of the Noon Day Club of St. Louis.

The Nubian Iron Enamel Company of Cragin, Ill., whose main warehouse (250 x 50 feet, two stories) was entirely destroyed by fire February 17, are again manufacturing to their fullest capacity. Before the fire had been extinguished Manager Bonnell was telegraphing for supplies and arranging for the continuance of business. Materials have been contracted for and two buildings instead of one are now under process of construction. The company will, of course, suffer some inconvenience for 60 to 90 days, but they will do their best to satisfy their customers.

Howe Scale Works, Rutland, Vt., have bought the stock, plant, patents, &c., of the Harrison Conveyer Company, Chicago, Ill., and the business will be removed to Rutland at an early date. The Harrison Conveyer is a device for conveying coal, grain, ice, &c., and has been in successful operation for several years. Howe Scale Works are also bringing out a new Letter Copying Press, which will be put on the market at once.

Ranson Hardware Company have been established at Burlington, Vt., for the manufacture of Bronze Hardware in variety. They occupy a new factory in the Scarff Addition, a district of Burlington, and are preparing to do a large business.

The Dubuque Stamping & Enameling Works will commence active operations about April 1.

The Standard Steel Wire Mat Company, recently organized, of New Castle, Pa., have leased the plant of the old Cunningham foundry, which is said to be well located and a substantial building. The concern are now having their machinery erected and are fitting up the plant and will commence operations at an early date.

The Phoenix Knife Company have succeeded to the business of the Central City Knife Company, manufacturers of Pen and Pocket Cutlery, Phoenix, N. Y. The business will be conducted under the management of the following officers, who were also officers in the old company: H. C. Breed, president; H. A. Dygert, vice-president; J. I. Van Doren, secretary, and E. Merry, treasurer.

Concerning the statement which has lately been circulated in connection with the Branford Lock Works, it may be said that there is no strike there nor has any been contemplated that the managers of the company are aware of. The establishment is not closed, nor likely to be.

What was referred to probably was the fact that in the manufacture of Mineral and Porcelain Knobs it was found there was no profit in the goods at present prices, and temporarily that department has been closed, but is expected to be running again before long.

The Axe factory of A. G. Peck & Co., on Saratoga Street, Troy, N. Y., was recently damaged by fire to the extent of \$2000, covered by insurance. It is supposed to have caught from a lamp.

Price-Lists, Circulars, &c.

ENTERPRISE MFG. COMPANY of Pennsylvania, Philadelphia, Pa.: Sixteen page pamphlet showing new goods and including complete schedule of list prices. The articles illustrated are Enterprise Ice Shredders, Tinned Flag Holders, Meat Chopper No. 3, Bait Chopper No. 33, Meat Chopper No. 44, Enterprise Shoe Stand and Lasts, Dried Fruit and Sugar Auger, New Cherry Stoner No. 12, and Bull Frog Door Weight.

GRAND CROSSING TACK COMPANY, Grand Crossing, Ill.: Steel Nails, Tacks, &c. A price-list of these goods, to which are added the prices of Tin Washers and Washer Nails to their former list.

WILCOX, CRITTENDEN & Co., Middletown, Conn.: Supplement to 1890 catalogue. The supplement, dated March 1, 1893, contains illustrations and prices of Ship Chandlery, Marine and Awning Hardware. Cuts show Brass Hinges, Skylight Quadrant, Skylight Hinges, Boom Bands, Mast Bands, Davis Standard Rowlocks, Cleats, Jib Snap Hooks, Chain, &c. The firm state that it will be their object in the future, as it has been in the past, to maintain a high standard in these goods.

WHITMAN & BARNES MFG. COMPANY, Kansas City, Mo.: Hawkeye Wire Nail Rakes. The Rakes are made with wooden heads, wire nail teeth, iron handle socket, with heads from 6 inches to 22 inches in length. The Lawn Rake has adjustable rider teeth to prevent the other teeth from catching and tearing the sod. It is also provided with a catch wire brace.

CHICAGO SPRING BUTT COMPANY, Chicago, Ill.: Spring Hinges, Scranton Door Hangers and Hardware Specialties. A catalogue 6 x 9 inches is issued, also the same thing in envelope size for the convenience of the trade. The pages of the two catalogues correspond, so that the same discount sheet applies to both. Their Marble Water-Closet Door Hinge Attachment is adapted for attaching their line of Spring Butts and is carried in stock. The Chicago Uncle Sam Barn Door Hangers, pieceless body, are referred to as a new departure. Shoe Blacking Foot Rests are shown, new in principle, made japanned and of bronze metal. Illustrations are given of Door Kick Plates. A line of Bronze Metal Door Pulls has recently been added to their other goods.

COLEMAN HARDWARE COMPANY, Chicago, Ill.: Catalogue and price-list. Illustrations are shown of Philadelphia Miller's, Truck, Bracket, Bed and Globe Casters; Fox Casters, in plate and bed; Anti-Friction Casters and Brass Caster Rings. Also of Morris New Anti-Friction Barn Door Hangers, Nickel Barn Door Hanger, Nickel Anti-Friction, J. G. C. and World's Fair Hangers, Track, Stay Rollers, Spring Hinges, Shumard Sash Balance, Sash Pulleys, Sash Pulley Machines, &c.

SHEPARD HARDWARE COMPANY, Buffalo, N. Y.: Fine Castings. The company issue

a neat pamphlet, calling attention to the stove plate and small castings made by the Shepard Foundry. Letters from customers who have used the gray iron castings, consisting of stove plate and small castings, indicate that these products have given satisfaction, and that they have been used for consecutive years by the largest and best known manufacturers in the country.

MOORE MFG. & FOUNDRY COMPANY, Milwaukee, Wis.: Hardware, Differential Pulley Blocks, Door Hangers and Rail, Registers and Ventilators, &c. The catalogue is well bound in stiff cloth covers, and contains additions to their line, including convex Registers, round-face Ventilating Plates, Flue Ventilators, Ash-Pit Doors, Grindstone Fixtures and the Lundy Silent Steel Parlor-Door Hanger. Attention is directed to Moore's Self-Locking Loose Axle, as used in their Door Hangers; also to their Differential Blocks, Registers, Elevator Hangers, Locks, &c.

MORRIS IMPLEMENT COMPANY, Glade Spring, Va.: Continental Reapers, Binders, Mowers and Disk Pulverizers, manufactured by the Johnston Harvester Company; Peerless Machinery; the Thomas Hay Tedder, Lawn Mower, Pumps, &c., and other Machinery and Implements. The company issue this catalogue to their trade, and are anxious to extend their line of agencies for goods suitable for their territory.

It Is Reported—

That W. H. Shelhamer, Hardware and Implement dealer, Holstein, Neb., has sold out.

That the Hardware establishment of Veith, Martindale & Baker, Oakland, Iowa, was damaged by fire on the 24th ult.

That burglars raided the store of the Harston Hardware Company, Richland, Mo., on the night of the 24th ult., and carried off a quantity of guns and ammunition.

That Arthur Frederick will soon enter the Hardware business at Fulton, S. D.

That Henry Meyer & Co. have purchased the stock of Stoves, Tinware, Hardware, Farm Machinery, Buggies, &c., formerly carried by Wilhelmy & Son, Nebraska City, Neb.

That P. C. Messick, an old Hardware man, of Goshen, Ind., has purchased the Hardware stock of Fidler Bros. of Wakarusa, Ind.

That Hiram Rogers, South Royalton, Mass., has taken his son as a partner in his Stove and Tin business.

That J. E. Ballinger has purchased an interest in a Hardware store at West Mansfield, Ohio.

That Mr. King of King & Orr, Hardware merchants, Mount Pleasant, Tenn., has sold out his interest to Alexander Orr. Mr. Orr will continue the business under the style of the Orr Hardware Company.

That B. F. Perry, Hardware dealer, Malden, Mass., has rented the store adjoining his present establishment and has connected them.

That George Sanborn's Stove store at Gloucester, Mass., was destroyed by fire on the 27th ult.

That Charles H. Atwood has sold his Hardware business at St. Albans, Vt., to Frank E. and Henry G. Folsom, who have taken possession of the premises.

That the Hardware store of Ingersoll & McDaniel, South Pittsburg, Tenn., was robbed on the 26th ult.

That W. A. Abel has retired from the Hardware house of Everson & Co., Syracuse, N. Y. Mr. Abel had been with the house for 26 years, 20 years as a traveling man and six as a partner.

That Ballard & Seeber are making extensive improvements in the interior of their Implement warehouse at Clinton, Iowa.

That the Hardware store of Blasser Bros., Moulton, Iowa, was burglarized on the 15th ult.; \$50 worth of Revolvers, Knives, Shears, &c., were secured by the thieves.

That a new Hardware store will soon be opened at Watkins, Minn., by Kaufman & Co.

That the Hardware store of Bryce & Ferguson at Waupun, Wis., was robbed on the 14th ult.

That William Wilson, postmaster of Mount Morris, Mich., will soon enter the Hardware business at that point.

That the Lucas & Barnett Hardware Company, Piqua, Ohio, have been incorporated and the following officers elected: W. T. Lucas, president; E. E. Barnett, vice-president, and Gilbert Howell, secretary.

That at the annual meeting of the Morris Hardware Company, Youngstown, Ohio, recently held, the following board of directors was elected: H. M. Garlick, J. H. Morris, W. J. Hitchcock, J. L. Botsford, W. J. Whitworth, L. F. Cockran and Hugh B. Wick. The officers of the company are: H. M. Garlick, president; W. J. Hitchcock, vice-president; J. H. Morris, general manager, and W. J. Whitworth, secretary and treasurer.

That A. K. Stanbro has sold his Hardware store at Springville, N. Y., to J. S. Wheeler, and will remove to Salamanca soon.

That Charles H. Parker of Macedon Center, N. Y., has purchased the interest of Carl Wood in the Hardware firm of Wood & Son, the change taking effect April 1.

That John Leggett, of Cuba, N. Y., has purchased the Hardware business of Pettit Bros. at that place. Henry Pettit will manage the store.

That J. B. Fisher, Winchendon, Mass., will shortly enlarge his tin shop.

That G. B. McConnell has sold out his Hardware business at Dewese, Neb., to G. Weaver.

That the Hardware stores of William Kempf and Simms Bros., St. Louis, Mo., were burglarized on the 26th ult.

That J. Lang, Hardware dealer at Farewell, Neb., has formed a partnership by which the business will hereafter be carried on under the style of Jepsen & Lang.

That W. E. Moore, Hardware merchant, Donathan, Neb., has sold out to Hawk, Linn & Co., who are successors to J. B. Hawk & Son.

That Morgan, Ruth & Olson, Implement dealers at Newman's Grove, Neb., have been succeeded by Olson & Ruth.

That P. H. Bennett has disposed of his Hardware and grocery business at Memphis, Mo., to G. S. Warren.

That George H. Gregory has opened a Hardware store at Lansing, Mich.

That Riggs & Sons, Cabery, Ill., have been making improvements in their Hardware store by which its attractiveness has been increased.

That thieves recently got away with \$50 worth of Hardware from the store of William Faries, Smyrna, Del.

That the Hardware store and warehouse of J. D. Renner, Oregon City, Ore., were entirely destroyed by fire on the 14th ult.

That burglars broke into F. C. Cooper's Hardware store at Shelby, Mo., on the 12th ult., and stole \$50 worth of Hardware, Knives, &c.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Rather slow trade has been the one prominent feature in the market for the general line of Paints and Colors. Next to this comes a little irregularity in prices for some prominent brands of White Lead in territory where the "outsiders" are most aggressive, and, behind that, a reduction in prices for Carmine, besides some irregularity in prices of other Colors, the natural deduction from which is that general trade conditions at the moment tend to stimulate competition. That initial results for the spring season have been somewhat disappointing is admitted in various quarters, but the belief obtains that a natural reaction is sure to come about, but whether this will have a sufficient force to brace up the weak spots in the market is a question upon which opinions are more conflicting.

White Lead.—Some favored customers who have seen fit to place good-sized orders at a "special" discount, enabling them to compete to advantage with the product of outside corrodors, have secured certain brands that are controlled by the National Lead Company at prices a little below the regular list of that concern. Just what concession was made is not clear, but, in view of the fact that some "outsiders" cut the combine rate to the extent of $\frac{1}{4}\phi$ @ $\frac{1}{2}\phi$, it would seem reasonable to suppose that the favored few have been able to buy at $6\frac{1}{4}\phi$, less regular discount, for lots of 12 tons or more. Together with rather aggressive tendency on the part of some independent corrodors, and disregard of list prices on small lots by more jobbers than one, this serves to give the market a somewhat unsettled appearance for the time being. Business has been a little larger the past few days, but the season is still a backward one, and it is doubtful if either pure carbonate or the various mixtures have moved out to fully the usual extent that they do early in March.

Red Lead and Litharge.—There has been some improvement in the volume of business in domestic product, also slightly better trade in foreign Lead, but the movement is yet rather backward for the season. Old prices are quoted throughout, but concessions are sometimes made where particularly desirable orders may be involved.

Zincs.—Large supply and low prices for Ores naturally prompt observant buyers of large lots of American Oxide to look for some modification in prices of the latter, since, not only being cheaper, the production is on a very liberal scale. Thus far, however, manufacturers' agents claim that the old list is steadfastly adhered to, and that existing conditions cause no uneasiness as far as they are concerned. Foreign Zincs move in moderate quantities only, yet to a very fair extent, and the several brands are held at former prices.

Colors, &c.—A reduction in price of No. 40 Carmine has been made, the official quotations at present being \$2.75 for bulk, \$2.85 for 1-lb bottles, and \$3.75 for 1-ounce bottles, with usual discount of 1 % for cash in ten days. In other standard Dry Colors no remarkable changes have taken place, but slow trade exerts a rather unfavorable influence and it is only in few instances that close buyers cannot secure a little concession from popular quotations. Oil Colors and the general line of mixed Paints are still rather quiet, but faring somewhat better than they did a week or ten days ago.

Miscellaneous.—Chalk, Paris White and Whiting have undergone no change and the market for the respective goods is devoid of new feature. Clays generally

are quiet, with no change aside from slightly firmer prices for Terra Alba.

Oils and Turpentine.

Lard prices have reacted considerably from the lowest point touched during the period covered by our last review. Inferior greases have improved somewhat in consequence, and some lines of Oils that stood on the ragged edge when the market for hog product looked shakiest have since turned for the better. In a few instances, Cotton-Seed products particularly, the turn is somewhat pronounced, but taken as a whole, the change has been mostly in the temper of sellers. That is to say, business has been stimulated but little in any department, and the surface indications are that where sentiment has been most conspicuously agitated leading operators are more inclined to make the best of the opportunity to realize profits than to add to their present holdings. For the present, consumptive movement is of commonplace character, and merely fair all told.

Linseed Oil.—The movement in this line has been a little slow, the result doubtless of late unfavorable weather conditions, but the market is in very good shape otherwise. That is to say, competition in this city and vicinity is on temperate lines, the several crushing interests seem inclined to avoid friction, and, according to some of the leaders in the trade, it requires merely a freer movement into the channels of consumption to bring about a higher range of prices, since all signs point to a heavy consumption when spring season demand gets well under way.

Cotton-Seed Oils.—Last week's break in prices has been followed by quite as pronounced movement in the opposite direction. In other words, an almost complete recovery in prices has taken place, and that, too, without the movement of a great deal of Oil. Speculation doubtless figures with some prominence in the "ups" as well as the "downs" of the market, but the relation of supply and demand, together with the condition of the Lard market, is a factor of no mean importance. Prime quality crude Oil has been sold at from 45ϕ up to 53ϕ , and at this writing there is little on offer at less than 55ϕ . Prime Summes Yellow, which went at 59ϕ early in the week, advanced to 62ϕ , while Summer White, after selling at 63ϕ , appreciated to 65ϕ @ 66ϕ . Future movements are dependent in a good measure upon the Lard market, and the latter is as uncertain as it has been in the experience of the market for any article of erratic value.

Lard-Oil.—City pressers have varied their prices very little despite the erratic course of the market for raw materials and the position of the market has not varied except to the extent of a few concerns making special prices on future deliveries when prices for the raw material were lowest. At this writing the prices for prompt and future deliveries show very little margin of difference, being on the basis of $\$1.05$ @ $\$1.07\frac{1}{2}$ for prime Winter in wholesale quantities.

Miscellaneous.—Nothing new has transpired in crude Menhaden, Sperm or Whale, and the manufactured products are moving at former prices, but in a hand to mouth way only. Palm Oil has advanced considerably, being now quoted at $73\frac{1}{4}\phi$ @ $81\frac{1}{4}\phi$, as to quality, with little supply on offer. Coconut Oils are a trifle irregular, although showing no radical change, and move rather slowly. Olive Oil rather slow, but bringing former prices. Cod, Tallow, Neatsfoot and Red Oils are in limited demand, but very firmly held.

Spirits Turpentine.—Prices receded somewhat during the early part of the week, under the influence of slow demand, but change in that respect brought about a reaction to $34\frac{3}{4}\phi$ @ 35ϕ for regular and $35\frac{1}{2}\phi$ for machine barrels, at which figures very fair sales were made toward the close.

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Leggett's Liquid White Glue.

Leggett & Brother, 301 Pearl street, New York, are putting liquid white glue upon the market, illustrations of the styles of the packages being shown herewith. The glue is put up in 1 and 2 ounce bottles as in Fig. 1; and in 4-ounce, $\frac{1}{2}$ -pint and 1 pint cans, Fig. 2, with brush



Fig. 1.—Liquid White Glue in Glass.

attached in all cases. The manufacturers remark that the glue as put up is ready for use and may be thinned with water without injury; that it will keep in all climates without spoiling and with no unpleasant odor, and that it does not thicken or freeze in cold weather or become thin in warm weather, and is not affected by changes in the atmosphere. It is recommended by the manufacturers for wood work, carriages, emery wheels, belting, &c., and may also be used for mending crockery and glass. It is stated that the glue does not crimp or crinkle paper, may be used for labeling on tin or glass, and that articles

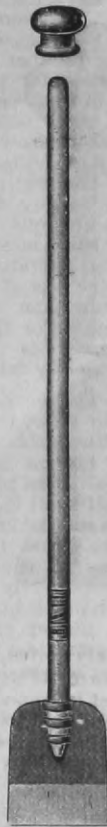


Fig. 2.—Liquid White Glue in Tin.

upon which it is used do not fall apart in damp, sultry weather. The corks, with brush attached, are prepared to obviate their sticking to the glass or tin. The glue is also put up in tin cans with double cover, in 1 quart, $\frac{1}{2}$ gallon and 1 gallon sizes.

A New Ice Chopper.

A. M. Ross & Co., Ilion, N. Y., are putting the ice chopper illustrated herewith upon the market. It is made from



A New Ice Chopper.

one piece of steel, so formed as to make the handle socket identical with the chisel blade, the handle being self-tightening by use. The two pieces, blade and handle, complete the chopper, except for those who like more weight, a cast-iron socket head in ball form is provided. This is attached to the end of the handle, thus making a heavier chopper.

Creasey Ice Breaker.

Jos. S. Lovering Wharton, Germantown Junction, Philadelphia, Pa., is introducing a new style and design of the Creasey ice breaker, as herewith shown. The picks



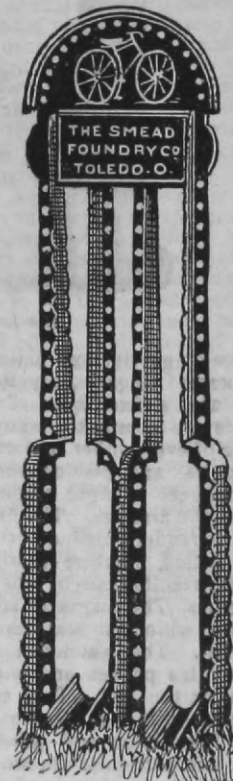
Creasey Ice Breaker.

or teeth used on the drum are of forged steel, while the general construction is referred to as tending toward compactness and strength. The machine is arranged for bolting to a wooden stand, which forms a receiver below for the broken ice.

The breaker is recommended by the makers for use in hotels, restaurants, and for caterers and ice cream manufacturers.

Smead's Bicycle Post.

The Smead Foundry Company, Toledo, Ohio, are offering a bicycle hitching post, as illustrated herewith. It is made with two stalls to accommodate two wheels at the same time. The wheels are run between the standards and may be locked to the post, insuring their safety, and avoiding accidents to the machines which may occur from leaning them against the curb, against a tree or building. They also serve as a safe place to store wheels when making calls at stores, offices or residences. The



Smead's Bicycle Post.

posts are made with and without shanks; with shank they can be fastened in the ground at a convenient place on the lawn or inside the walk, while those without shank are provided with a base to be screwed to the floor or walk.

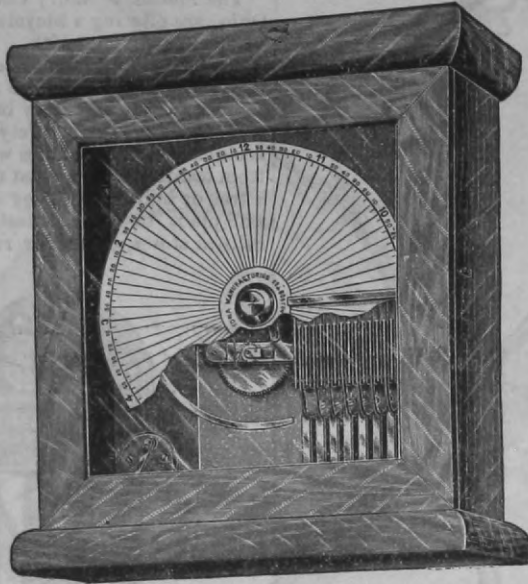
Bernhard Stadelman, Pittsburgh, Pa., are manufacturing the Keystone Coffee Jar. The vessel is made of flint glass, with a nickel-plated cork-lined cap, designed to keep liquids carried in the Jar free from rust or acid. The keystone shape of the Jar is referred to as adapting it to oval or square dinner pails and baskets, and the glass of which it is made as preserving the natural flavor of the liquid as long as desired, besides being always sweet and clean. The Jar is made in pint and quart sizes.

Bellaire Stamping Company, Harvey, Ill., are now manufacturing a kitchen ware which they call the Columbian Enameled Steel Ware. It is of a bright gray color, attractive in appearance, and the company claim that the shapes and trimmings are in many cases an improvement on similar goods now on the market. Their factory is thoroughly equipped and in splendid running order and they are turning out a large quantity of this ware daily. The capacity being quite large, they are in a position to take care of all the business offered them and can make prompt shipments.

The Iona Watchman's Register.

The accompanying cut represents a watchman's register being introduced by the Redding Electric Company, Boston, Mass. The novel features consist of the combination of a set of hammers or arms,

The manufacturers claim that the iron is slightly tapered, and that if the stake is tapered to correspond it will not rattle or hang over, but slip down until it has an equal bearing on all four sides; that it will not wear the sill nor loosen itself from the bed of the truck; that it being a pocket



The Iona Watchman's Register.

held in place by gravity and actuated by magneto-operated magnets, together with a time dial and a fixed type of figures. The magnets are compactly arranged by the bending of every other armature arm at right angles, and placing the corresponding magnet at right angles above and between the first set. The fixed type is designed to render a distinct, even printing of the station numbers possible, and to give better results than by the use of movable figures. The magnetos are placed at the stations which the watchman is expected to visit. The watchman carries a special key in his pocket and makes one or two turns on the box. This operation is described as bringing up the hammer against the ink ribbon and printing the number of this particular station on the time dial, making a clear and indelible record of the exact moment of the watchman's visit. This record, it is stated, cannot be counterfeited or produced in any other way by the watchman or his confederates. The entire mechanism of this instrument is inclosed in a polished oak case, 16 x 18, and can be placed in the office to register from as many points as desired. In this way the watchman registers the time of his visits to his different posts.

The W Mortise Stake Iron.

The Minnesota Hardware Company, 292 East Seventh street, St. Paul, Minn., are offering the stake iron herewith shown, as



The W Mortise Stake Iron.

a mate to their stake pocket, illustrated in the *Iron Age* December, 22, 1892. It is made of malleable iron, constructed to embody the greatest possible strength with the least amount of iron. The point is made that this materially increases the lightness of the truck without diminishing its strength. It is provided with four lugs to be bolted firmly to the sill, and has four metallic walls, three of which, it is explained, extend sufficiently below the sill to give the stakes double bearing and purchase power, with no chance to break.

for itself and firmly bolted, will not press out the band surrounding the bed, and that when a cast-iron pocket has worn away the sill of the truck, the W iron may be put in its place, as the side flanges can be securely bolted between the iron band and the sill of the truck. A hole is provided in the bracket of the extension lips to fasten a stake chain, thereby avoiding losing stakes when removed.

Screw-Base Fence Post.

Capital City Fence Company, Indianapolis, Ind., are offering a screw-base post, as illustrated herewith. The post is described



Screw-Base Fence Post.

as having the base cast from gray iron with two spiral flanges extending along opposite sides of the base, at a right angle from the center and at a uniform angle of

45° on the plane of the post. This construction enables the posts to be screwed into the ground instead of being driven or set in holes, and the manufacturers claim that after the post is in position the flanges give a direct and effectual resistance to the heaving action of frost, to the pulling of the wires over unequal ground surfaces and all other usual strains. It is stated that the post can be used successfully in any kind of soil and that it will remain substantially as placed.

Ideal Roller Base for Oil Stove.

The Huette-Barler Mfg. Company, 111 and 113 Lake street, Chicago, have devised a roller base for their Ideal oil

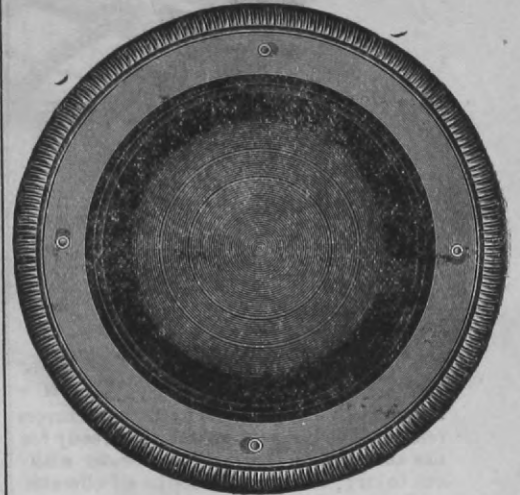


Fig. 1.—Ideal Roller Base.

heater, which they are now manufacturing for the trade. Fig. 1 is an illustration of this base. It is circular in form, made wholly of metal, has a nickel rim and curved fluted edge, a hard-baked japanned

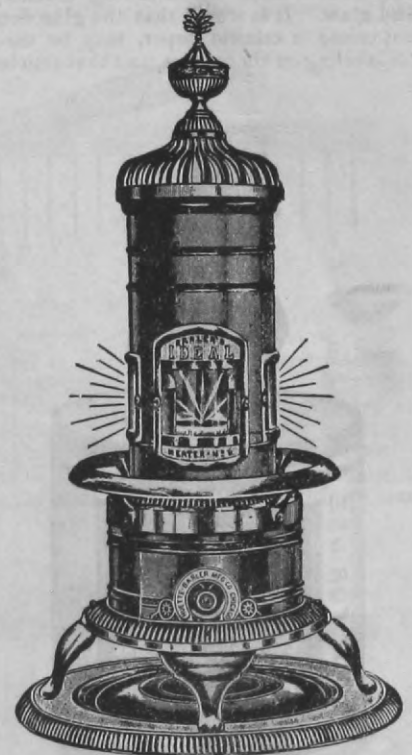


Fig. 2.—Roller Base in Use.

center, and is mounted on lignumvitæ wood wheel casters, on which the heater can be easily moved about. Fig. 2 is an illustration of the roller base in use. The legs of the stove are set immediately over projections on the base, securing a firm hold and covering the projections from view. The rim is deeply curved, so as to hide the caster from view also.

The Euclid Sociable.

The W. Bingham Company, Cleveland, Ohio, are introducing this novelty in cycles

of the drivers, with nothing under or back of the riders to trap them, and that it may be ridden by one person at any time and for any distance. A special seat is provided for a child between the steering

the teeth; the eyes also preventing the other teeth from digging in the ground, also that when the rake is drawn forward the cleaning bar is forced up the teeth to the head, and when the rake is raised



The Euclid Sociable.

for 1893, as illustrated herewith. The frame is made of true seamless steel, with the rear driver 30 inches in diameter, geared to 54 inches regularly, while 70 or 75 inches is permissible. The front wheels are 24 inches in diameter, ball bearings throughout, pneumatic tires and telescope steering head. Both riders use

wheels, and the saddles are adjustable to height and weight of riders. The machine weighs about 70 pounds.

Star Lawn Rakes.

Syracuse Specialty Mfg. Company, Syracuse, N. Y., are offering rakes as illus-

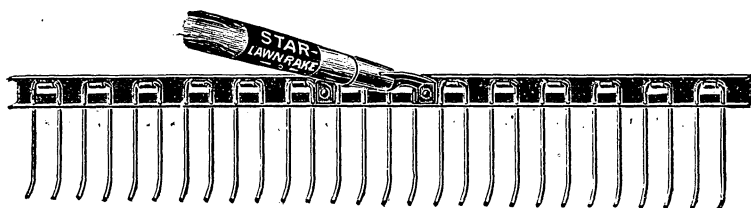


Fig. 1.—Star Lawn Rake.

the same driving gear, permitting, it is explained, the building of a much lighter cycle than could otherwise be made, and by doubling the propelling power upon the one set of gears divide the labor of each rider. The machine is finished in enamel, with nickel plating on copper.

trated in Figs. 1 and 2. The heads of the rakes are made of steel formed to make them firm and rigid, while the teeth are in the form of staples, as shown in Figs. 3 and 4, and are locked in the heads, so, it is stated, that it is impossible to turn or loosen them. The object of the self

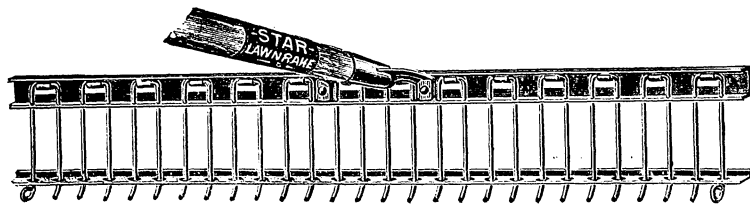


Fig. 2.—Star Lawn Rake, Self-Cleaning.

Regarding the advantages of the sociable, the manufacturers remark that it combines the best points of the old style sociables, with the ease, speed and convenience of the safety bicycle. It is stated that it is a small, light and at the same time a strong machine for one of its kind; that it will tilt, conforming to the curve of the road; that it carries its passengers on either side

cleaning attachment, Fig. 2, is to save time and trouble of cleaning the teeth by hand. The point is made that the simple method of attaching the bars obviates breakage or getting out of order, and that they keep the teeth free from leaves and grass. It is explained that the bars are stiffened by angles formed on them, and are held in position by eyes on the end of

from the ground, the dropping bar, by its weight, cleans the teeth. The manufact

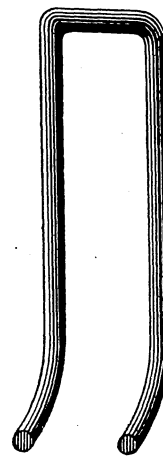


Fig. 3.—Form of Teeth.

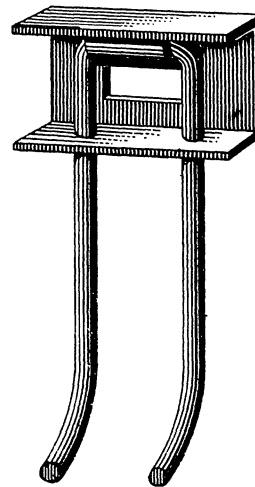
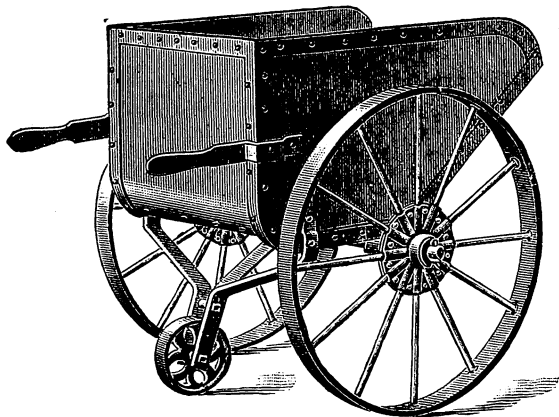


Fig. 4.—Form of Head, Tooth Locked.

urers remark that if Star rakes are carried over in stock, they will not become imperfect from warped heads or loose teeth.

Steel Charging Barrow.

The accompanying cut of Haslup's improved steel charging barrow represents the barrow as introduced by Sidney Steel Scraper Company, Sidney, Ohio. The box is made of steel plate, with the bottom, from the back to the mouth, $\frac{1}{2}$ inch thick, and the sides $\frac{1}{4}$ inch thick. The sides and bottom are riveted together with 2-inch steel angles, $\frac{1}{4}$ inch thick. An extra plate or false bottom of No. 10 gauge steel, 14 x 28 inches, is riveted to the bottom to break the fall of ore when thrown into the barrow, and a 2-inch iron band is riveted around the top of the barrow. The handles are regularly 12 inches long, but are made longer when so ordered. The wheels are 34 inches in diameter, with tire $2\frac{1}{2}$ x $\frac{1}{4}$ inches, 12 $\frac{1}{4}$ -inch spokes and malleable iron hub, 9 inches in diameter, with $1\frac{1}{2}$ -inch steel axles, and are referred to as heavy and well adapted to hard work. The drag wheel is 8 inches in diameter, $1\frac{1}{2}$ -inch face, and attached to the sides and



Steel Charging Barrow.

bottom by heavy iron hangers. The capacity of the barrow shown in the cut is stated to be 10 cubic feet, accommodating 1500 pounds of ore or 500 pounds of coal, weighing complete 550 pounds. The measurements of the box are given as: Greatest length, 40 inches, greatest width, 22 inches, and greatest depth, 28 inches. The barrows can be made of any size wanted.

The Perfection Mold.

Ideal Mfg. Company, New Haven, Conn., have put on the market an adjustable mold for grooved bullets only, as shown in Fig. 1. In Fig. 2 a partial idea is given of the work which can be done with the mold. It is explained that the adjustment in the mold can be varied, not only one groove at a time, but any fractional part thereof, varying the length and weight 5

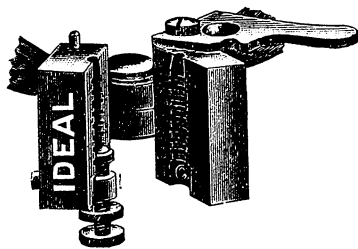


Fig. 1.—The Perfection Mold.

or 10 grains at a time, anywhere between the lowest and highest limit, thus securing any weight desired. The points of bullets of any length being the same, one adjustable chamber or seating screw answers for all. The point is made that with this mold

the owner can determine for himself just what is in his rifle at all ranges, with every variety of powder charge and weight of bullets, all at the expense of one mold. The bullets in Fig. 2 are shown with a hollow

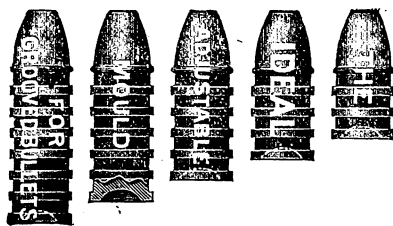


Fig. 2.—Bullets Cast in Perfection Mold.

base and the molds can be made as ordered, but the experience of the manufacturers lead them to prefer the flat base, as it does not gather and hold grease when lubricating. With hollow base bullets the grease

provided with combination union key, having a round bit and flat shank, thus giving additional security to the lock. The locks have a self-centering keyhole, boring for which simply requires a $\frac{7}{16}$ bit.

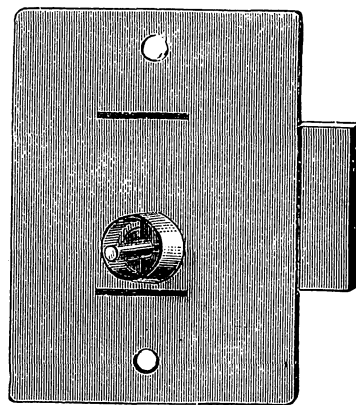


Fig. 1.—Hyatt Wardrobe Lock.

The locks are made entirely of steel, finished both in natural steel color and in bronze, with one key for each lock. The lock, including bolt and casing, meas-

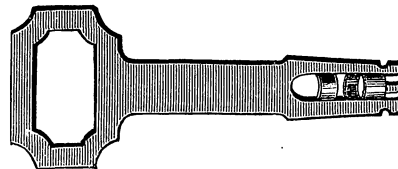


Fig. 2.—Key for Wardrobe Lock.

ures $\frac{3}{16}$ inch in thickness. The cylinder drawer lock, Fig. 3, is finished in steel and bronze, and is made in two sizes, $1\frac{1}{2}$ inch and $2\frac{1}{2}$ inch wide. The escutcheon fits a hole bored with a $\frac{7}{16}$ -inch bit, is self-finishing and is adapted for drawers

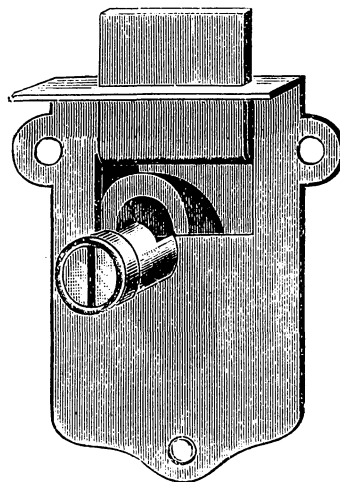


Fig. 3.—Hyatt Cylinder Drawer Lock.

having $\frac{7}{8}$ inch fronts. The amount of cutting out required to accommodate this lock is very small, being less than $\frac{3}{16}$ inch. The locks are provided with flat steel keys—one key to each lock of steel finish

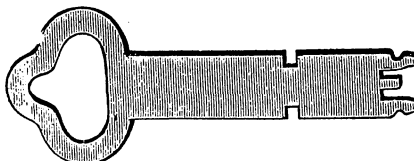


Fig. 4.—Key for Cylinder Lock.

and two keys to each bronze-finished lock, with 12 changes to a dozen.

The cuts shown are full size representations of the locks and keys. German drawer locks of similar construction are also made by the company.

Hyatt Cabinet Locks.

Brass Goods Mfg. Company, 92 Third street, Brooklyn, for whom J. H. Walbridge & Co., 43 Leonard street, New York, are sole agents, are introducing locks as shown herewith. The feature of these locks is the entire absence of springs and the thinness of the working parts—the bolt being thrown by an eccentric shaped thin piece of metal, into which the key fits. The wardrobe lock, Fig. 1, is made in three sizes: $1\frac{1}{2}$ x $2\frac{1}{2}$, $1\frac{1}{2}$ x 3 and 2 x $3\frac{1}{2}$ inches; also in sizes 1 inch wide, longer and narrower than the foregoing, suitable for library doors, &c. The locks represented by Fig. 1 have broad bolts, which shoot both right and left, and are

Current Hardware Prices.

MARCH 8, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5% signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... \$ doz \$3.00, 33%
Excelsior..... \$ doz \$10.00..... 60&10&2%
North's..... list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

Eagle Anvils, # 10 9¢..... 15@15&5%
Peter Wright's..... 11@11%
Armstrong's Mouse Hole..... 10¢@11%
Am. Wrought, Horse shoe brand, 11@11%
Trenton..... 10¢@11%
Wilkinson's..... 10¢@11%
Moore & Barnes Mfg. Co..... 33%
Anvil Vise and Drill—

Millers Falls Co., \$18.00..... 20%
Cheney Anvil and Vise..... 25%
Allen Anvil and Vise, \$3.00..... 40&10%
Star..... 45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co..... }
Wm. A. Ives & Co..... } 75%
Humphreysville Mfg. Co..... }
French, Swift & Co. (F. H. Beecher) }
P. S. & W. Co..... }
Rockford Bit Company..... }
Cook's, Douglass Mfg. Co..... 55%
Cook's, N. H. Copper Co..... 60%
Ives' Circular Lip..... 30%
Patent Solid Head..... 60%
C. E. Jennings & Co., No. 10, extension }
Hip..... 40%
C. E. Jennings & Co., No. 30..... 60%
C. E. Jennings & Co., Auger Bits, # set, }
32 1/4 quarts, No. 5, \$5; No. 30, \$3.50, 25%
Lewis' Patent Single twist..... 25%
Russell Jennings' Augers and Bits 25&10%
Imitation Jennings' Bits..... 60&10&10%
Pugh's Black..... 20%
Pugh's Jennings Pattern..... 30%
Car Bits..... 60&10&10%
Car Bits, P. S. & W. Co..... 60&10%
Snell's Car Bits..... 15&10%
L'Hommedieu Car Bits..... 15&10%
Kortner Pat. Auger Bits..... 20%
Cincinnati Bell-Hangers' Bits..... 30&10

Bit Stock Drills—

Morse Twist Drills..... 50&10&5%
Standard..... 50&10&5%
Cleveland..... 50&10&5%
Syracuse, for wood (wood list), 30&10&5%
Cincinnati, for wood..... 30&10%
Cincinnati, for metal..... 45&10%

Expansive Bits—

Clark's small, \$18; large, \$26. 35@35&10%
Ives' No. 4, # doz \$90..... 40%
Swan's..... 40%
Steer's, No. 1, # doz \$22..... 40%
Stearns' No. 2, \$48..... 20%

Gimlet Bits—

Common..... \$ gross \$2.75 @ \$3.25
Diamond..... \$ doz \$1.25..... 40&10%
Bee..... 25@25&5%
Double Cut, Sheppardson's..... 45@45&10%
Double Cut, Ct. Valley Mfg. Co..... 30&10%
Double Cut, Hartwell's, # gro., \$5.00, 35%
Double Cut, Douglass..... 40&10%
Double Cut, Ives..... 60&10&10%

Hollow Augers—

Ives..... 33 1/4 @ 33 1/2
French, Swift & Co..... }
Douglass..... } 10%
Bonney's Adjustable, # doz \$48..... 50%
Stearns'..... 20&10%
Ives' Expansive, each \$4.50..... 60&5%
Universal Expansive, each \$4.50..... 20%
Wood's..... 25@25&10%
Cincinnati Adjustable..... 25&10%
Cincinnati Standard..... 25&10%

Ship Augers and Bits—

L'Hommedieu's..... 15&10@16&10&5%
Watrous'..... 25@25&10%
Snell's..... 15&10@15&10&5%
Snell's Ship Auger Pat'n Car Bits, }
15&10@15&10&5% }

Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common..... \$ gr. 85¢ @ 90¢
Awls, Should. Peg..... \$ gr. \$1.50 @ \$1.55
Awls, Pat. Peg..... \$ gr. 35¢ @ 36¢
Awls, Shouldered Brad..... \$ gr. \$1.30 @ \$1.40
Awls, Handled Brad..... \$ gr. \$2.50 @ \$3.00
Awls, Handled Scratch..... \$ gr. \$4.00 @ \$4.50
Awls, Socket Scratch..... \$ doz. \$1.10 @ \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Plain. Beveled.
First quality, best brands, \$7.00..... \$7.50
First qual., other brands..... 6.50 7.00
Second quality..... 5.50 6.00

Axle Grease—See Grease, Axle.

Axles—

No. 1..... 3 1/4 @ 4 1/4, No. 2, 5 @ 6%
Nos. 7 to 14..... 60&10%
Nos. 15 to 18..... 47%
Nos. 19 to 22..... 7%
Concord Axles, loose collar..... 4 1/4 @ 6¢
Concord Axles, solid collar..... 5 1/4 @ 7¢
National Tubular self Colling..... 33 1/2 @ 33 1/2 & 5%

Bag Holders—See Holders, Bag.

Balances—

Spring Balances..... 40%
No. 3000 20 30
Chatillon, # doz..... \$0.50 0.95 1.75 net
Chatillon Straight Balances..... 40%
Chatillon Circular Balances..... 50&10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel..... \$ doz 3 1/4
Iron, Steel Points..... \$ doz 3 1/4

Basins, Wash—

Standard Fiberware, No. 1, 10 1/2-in., \$1.80;
12-inch, \$2.00; 13 1/4-inch, \$2.50; 15-inch,
\$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82. 50&10@50&10&5%
Chatillon's No. 1..... 40%
Chatillon's No. 2..... 50%
Custer's..... 33 1/2%

Beaters—

Egg—
Dover..... \$ doz \$1.00 @ \$1.20
Duplex (Standard Co.)..... \$ doz \$1.00
Dover (Standard Co.)..... \$ doz \$1.00
Duplex Extra Heavy (Standard Co.)..... \$ doz \$3.50
Bryant's..... \$ doz \$2.00
Double (H. & R. Mfg. Co.), # gro., No. 0 }
\$12.00; No. 1, \$15.00; No. 2..... \$36.00
Easy (H. & R. Mfg. Co.)..... \$ gro \$12.00
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50
Spiral..... \$ gro \$4.25 @ \$4.50
Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$2.00
Palme, Diehl & Co.'s..... \$ gro \$24.00
Silver & Co..... \$ doz \$5.50

Cullinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2..... 20%

Bells—

Cow—
Common Wrought..... 60&10%
Western, Sargent's list..... 70&10%
Kentucky, "Star"..... 20&10%
Kentucky, Sargent's list..... 70&10%
Kentucky Durham..... 70&10%
Dodge, Genuine Kentucky..... 70&10%
Texas Star..... 50&10@50&10&5%

Door—

Gong, Abbe's..... 33 1/4 @ 10%
Gong, Yankee..... 45&10%
Gong, Barton's..... 40&10&5%
Crane, Brooks'..... 50&10&2%
Crane, Cone's..... 10%
Crane, Connel's..... 20&10%
Lever, Sargent's..... 60&10%
Lever, Taylor's Bronzed or Plated..... net
Lever, Taylor's Japanned..... 25&10%
Lever, R. & E. Mfg. Co.'s..... 50&10&2%
Pull, Brook's..... 50&10&2%

Electric—

Wollensak's..... 20%
Bigelow & Dowse..... 20%

Hand—

Light Brass..... 70&10@70&10&5%
Extra Heavy..... 70%
White..... 70%
Lever, R. & E. Mfg. Co.'s..... 33 1/2 @ 10%
Globe Cone's Patent..... 25&10@35%

Miscellaneous

Call..... 45@50%
Farm Bells..... \$ doz 3 1/4 @ 3 1/2
Steel Alloy Church and School Bells..... 40%

Bellows—

Blacksmiths'..... 60&10&5@60&10&10%
Molders'..... 40&10&5@50%
Hand Bellows..... 40&10&5@50%

Belted, Rubber—

Common Standard..... 70&10@75&5%
Standard..... 70&5@70&10%
Extra..... 60&10@60&10&5%
N.Y.B. & P. Co., Carbon..... 60%
N.Y.B. & P. Co., Diamond..... 50%
N.Y.B. & P. Co., Para..... 40%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire

Stoddard's Lightning Tire Upsetters..... 15%
Detroit Perfected Tire Bender..... 15%
Green River Tire Benders and Upsetters..... 20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron. 50&10&10%
Moore's Novelty, Mal. Iron..... 50%
Sure Grip Steel Tackle Blocks..... 25%

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84..... 75&10&5@80%
Genuine Eagle, Norway, list Oct. '84..... 80%
Eagle, Norway, list Oct. '84..... 80&5@80&10%
Phila. pattern, list Oct. '84..... 80%
R.B. & W., old list, Sargent's list..... 70%
Machine, list Jan. 1, 1890..... 60&10&5%
Wrought Barrel..... 70&10@75%
Bolt Ends, list Jan. 1, 1890..... 30&10%

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70&10%
Cast Iron Shutter Bolts..... 70&10%
Cast Iron Chain (Sargent's list)..... 65&10%
Ives' Patent Door Bolts..... 60&10&10&5%
Wrought Square..... 70&10@75%
W.R. Shutter, all Iron, Stanley's..... 60&10@60&10&10%
W.R. Shutter, Brass Knob..... 60&10%
W.R. Shutter, Sargent's list..... 60&10%
W.R. Sunk Flush, Sargent's list..... 60&10%
W.R. Sunk Flush, Stanley's list..... 60&10&5%
W.R. B. K. Flush, Common..... 55&10%

Stove and Plow—

Stove..... 60&10@60&10&5%
Plow..... 60&10@50&60&10&10%
R. B. & W., Plow..... 55%

Tire—

Common, list Feb. 28, '83..... 65@65&5%
Port Chester Bolt and Nut Company..... 65%
Empire list Feb. 28, '83..... 65%
Keystone, Philadel., list Oct. '84..... 80%
Norway, Phila., list Oct. '84..... 75%
American Screw Company..... 75%
Norway, Phila., list Oct. 16, '84..... 75%
Eagle, Phila., list Oct. 16, '84..... 80%
Phila., list Oct. 16, '84..... 65%
Bay State, list Feb. 28, '83..... 65%
R. B. & W., Philadel., list Oct. 16, '84..... 80%

Borers, Tap—

Common and Ring..... 20&10%
Ives' Tap Borers..... 33 1/4 @ 35%
Enterprise Mfg. Co..... 20%
Clark's..... 33 1/4 @ 35%

Borax—

Per lb..... 9 1/2 @ 10 1/2

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon—

Per doz..... 2 1/4

Braces—

American Bit Brace and Tool Co.....
Nos. 10, 12, 20..... 60&10%
Nos. 21, 24, 27..... 70&10%
Nos. 28, 32, 36..... 60&10&5%
Nos. 13, 26, 36, 37..... 70&10&5%
Amidon's.....
Barker's Imp'd Plain..... 75&10@80%
Barker's Imp. Nickeled..... 65&10@70%
Ratchet..... 75&10@80%
Eclipse Ratchet..... 60%
Globe Wad..... 40&10&5%
Corner Brace..... 40&10&10%
Universal, 8 in., \$2.10; 10 in..... \$2.25
Buffalo Ball..... \$1.10 @ \$1.15
Barber's..... 50&10%
Saxton's.....
Barker's Imp. Polished..... 75&10@80%
Barker's Imp. Nickeled..... 65&10@70%
Ratchet, Polished..... 60&10@60%
Ratchet, Nickeled..... 40&10@50%
Buffalo Ball..... net, \$1.10 @ \$1.15
Bartholomew's.....
Nos. 27 and 30..... 50&10@60&5%
Nos. 17, 18, 19..... 70&10&5%
Carbide Bar, American..... 60&10%
Fray's Genuine Spotted's..... 50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414..... 60&10%
Ives' New Haven Novelty..... 70&10&5%
New Haven Ratchet..... 60&5@60&10%
Barber Ratchet..... 60&5@60&10%
Carbide Bar, American..... 60&5@60&10%
Spotted..... 60&5@60&10%
P. S. & W. Co., Peck's Patent..... 60%
Rose & Johnson..... 50%
Davis Patent..... 50&10%

Brackets—

Shelf, plain..... 65@70%
Regular, list..... 60&10@70&10%
Sargent's list..... 70&10%
Sargent's list..... 70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets..... 70&10%

Bright Wire Goods—See Wire.

Broilers—

Hens' Self-1 Inch..... 9 10 9x11
Plates..... \$ doz. \$4.50 5.50 6.50
New Haven..... 50%
Wire Goods Co..... 65&10%
Morgan Odorless..... \$ doz. \$12. 50%
Queen City..... 33 1/2%

Buckets, Well—

Galvanized—

Hill's..... \$ doz. 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad..... \$ doz. 14 qt. \$4.25 @ \$4.50
Helwig's Flat Iron Band..... \$3.75
Helwig's Wired Top..... \$ doz \$4.00

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butcher's.

Butts—

Brass—
Wrought Brass..... 80@80&10%
Cast Brass, Tiebout's..... 50%
Cast Brass, Fast..... 33 1/4 @ 10%
Cast Brass, Loose Joint..... 33 1/4 @ 10%

Cast Iron—

Fast Joint, Narrow..... 50&10&5@50%
Fast Joint, Broad..... 50&10&5@50%
Loose Joint..... 50&10&5@50%
Loose Joint, Japanned..... }
Loose Joint, Jap. with Acorns..... } 75@75
Parliament Butts..... } 20%
Mayer's Hinges..... }
Loose Pin, Acorns..... }
Loose Pin, Acorns, Japanned..... }
Loose Pin, Acorns, Japanned, }
Plated Taps..... }

Wrought Steel—

Fast Joint, Narrow..... }
Fast Joint, L.L. Narrow..... }
Fast Joint, Broad..... }
Loose Joint, Broad..... }
Table Butts, Back Flaps, &c..... }
Inside Blind, Regular..... }
Inside Blind, Light..... }
Loose Pin..... }
Bronzed Wrought Butts..... } 50@50&10%
List Jan. 2 1893. 40@40&10%

Calipers—See Compasses.

Calks, Toe—

Gautier, One Prong, Blunt..... 5 1/4 @ 6¢
Burke's One Prong, Blunt..... 5 1/4 @ 6¢
Burke's Two Prong, Blunt..... 7 1/4 @ 8¢
Burke's One Prong, Sharp..... 5 1/4 @ 7¢

Can Openers—See Openers, Can.

Cans, Milk—

S. S. & Co.: 5-gal., \$2.10; 8-gal., \$3.10;
10-gal., \$3.35 each..... 25%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic
Cartridge Co..... \$ 1000
F. L. Waterproof, 1-10's..... 35@37¢
E. B. Trimmed Edge, 1-10's..... 47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47@50¢
Musket, Waterproof, 1-10's..... 27@30¢
G. D..... 27@30¢
S. B. Genuine Imported..... 45¢
Eley's E. B..... 56¢@58¢
Eley's D Waterproof, Central Fire..... \$1.60

Primers—

Berdan Primers, \$1.00..... 25%
B. L. Caps (Sturtevant Shells) \$1.00..... 25%
All other Primers, \$1.20..... 3%

Cards—

Watson's Cotton, Wool, Horse and
File, list January 28, 1891..... 25%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Rim Fire Cartridges..... 30&5&2%
Rim Fire Military..... 15&2%
Cent. Fire, Pistol and Rifle..... 25&5&2%
Cent. Fire, Military and Sporting..... 15&5&2%
Blank Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.
Blank Cartridges, 22 cal., \$1.75..... 2%
Blank Cartridges, 32 cal., \$3.50..... 2%
Primed Shells and Bullets..... 25&5&2%
B. B. Caps, Round Ball, \$1.75..... 2%
B. B. Caps, Con. Ball, Swgd., \$2.00..... 2%
Oneida Halter Chain..... 60@60&5%
Galvanized Pump Chain..... \$ doz 5 1/4 @ 6¢
Jack Chain, Iron..... 80&10%
Jack Chain, Brass..... 80%

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed..... } Brass..... 55@55&10%
Plate..... }
Shallow Socket..... } Others..... 60@60&10%
Deep Socket..... 40&10%
Martin's Patent (Phoenix), 45&10@50&10%
Tucker's Patent, low list..... 45%
Payson's Anti-friction..... 70&10@10%
Payson's Truck..... 60@60&10%
Yale, Gen..... 45%
Giant Truck Casters..... 35%
Stationary Truck Casters..... 50&10%
Socket Truck Casters..... 50&50&10%
Gwinner's Common Sense..... 45%
Gwinner's Hercules..... 45%

Cattle Leaders—

See Leaders, Cattle.

Cement—

Victor Elastic..... 5 lb pails \$ 1 1/2

Chain—

Trace, Wagon and Fancy Chains,
List revised Oct. 15, 1892..... 60@60&10%
American Coil, in cask lots,
3-16 5-16 7-16 9-16 11-16 13-16 15-16 17-16 19-16 21-16 23-16 25-16 27-16 29-16 31-16 33-16 35-16 37-16 39-16 41-16 43-16 45-16 47-16 49-16 51-16 53-16 55-16 57-16 59-16 61-16 63-16 65-16 67-16 69-16 71-16 73-16 75-16 77-16 79-16 81-16 83-16 85-16 87-16 89-16 91-16 93-16 95-16 97-16 99-16 101-16 103-16 105-16 107-16 109-16 111-

Chalk Lines—See Lines.**Chisels—****Socket Framing and Firmer**

P. S. & W.	
New Haven.	
Wetherby.	75&10@75&10&5%
Mfr.	
Ohio Tool Co.	
Douglas.	75@75&5%
Buck Bros.	30%
Merrill.	60&10@60&10&5%
L. & I. J. White.	30@30&5%

Tanged and Miscellaneous.

Tanged Firmers.	50@50&10%
Butchers.	4.75@5.00
Spears & Jackson's.	\$5 to 2
Buck Bros.	30%
Cold Chisels.	15@15&5%

Chucks—

Beach Pat.	each, \$8.00.	20%
Morse's Adjustable.	each, \$7.00.	20&20&5%
Danbury.	each, \$6.00.	30&30&5%
Syracuse, Balz Pat.		25%
Graham Patent.		33&33%
Skinner's Patent Chucks.		33&33%
Combination Lathe Chucks.		40%
Universal Lathe Chucks.		40%
Independent Lathe Chucks.		40%
Drill Chucks.		15%
Union Mfg. Co.		
Victor.	\$8.50.	25%
Combination.		40%
Universal.		40%
Independent.		40%

Churns—

Timb Union, each, 5 gal.	\$3.25; 7 gal.	\$3.75; 10 gal.	\$4.25.
McDonald's St. Barrel Churn, each	6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.		

Clamps—

E. I. Tool Co.'s Wrought Iron.	25%
Adjustable, Cincinnati.	15&15%
Adjustable, Hammers.	15&15&5%
Adjustable, Stearn's.	30&30&10%
Stearns' Adjustable Cabinet and Corner.	30&30&10%
Cabinet, Sargent's.	70&70%
Carriage Makers', Sargent's.	75&75&5%
Carriage Makers', P. S. & W. Co.	40&40%
Eberhard Mfg. Co.	40&40&10%
Warner's.	40&40&10&5%
Saw Clamps, see Vises, Saw Filers.	
Carpenter's, Cincinnati.	25&25%

Cleavers, Butchers'

Bradley's.	25&30%
L. & I. J. White.	25&30%
Beatty's.	40&40&5%
New Haven Edge Tool Co.'s.	40%
P. S. & W.	33&33&10%
Forster Bros.	30%
Schulte, Lohoff & Co.	40&40&5%

Clips—

Norway, Axle, 1/4 & 5-16.	55&55&5%
2d grade Norway Axle, 1/4 & 5-16.	65&65%
Superior Axle Clip.	60&60%
Norway Spring Bar Clips, 5-16.	30&30&5%
Wrought Iron Felloe Clips.	50&50%
Steel Felloe Clips.	50&50%
Baker Axle Clips.	25%

Cloth and Netting, Wire**Cockeyes.****Cocks Brass—****Coffee Mills—See Mills, Coffee.****Collars, Dog—**

Chapman Mfg. Company.	50&10@60%
Medford Fancy Goods Co.	40&10@50%
Embossed, Gift, Pope & Steven's list.	30&30%
Leather, Pope & Steven's list.	40%
Brass, Pope & Steven's list.	40%

Combs, Curry—

Fitch's.....	50&10@50&10&10%
Rubber, per doz., \$10.00.....	25%
American Curry Comb Co.	33½@40%
Kohler's Magic Oscillating. 20 doz., \$2.00	
Kohler's Humane.....	20 doz., \$1.75

Compasses, Dividers, &c.

Compasses, Calipers, Dividers, 70&70&10%	
Bemis & Call Co.'s	
Dividers.	65%
Compasses.	50&50%
Calipers, Wing and Inside or Outside.	50&50%
Calipers, Double.	60%
Calipers, Call's Patent Inside.	30%
Excelsior.	50%
J. Stevens & Co.'s.	25&10%
Starrett's.	

Coolers, Water—

S. S. & Co.: 2-gal., \$2.30; 3-gal., \$2.60;	
4-gal., \$3.00; 6-gal., \$3.75 each.	33&33%

Coopers' Tools—**Cord—****Sash—**

Common.	9@10%
Patent, good quality.	11@12%
White Cotton Braided, fair.	24@25%
Common Russia Sash.	12@13%
Patent Russia Sash.	13@14%
Cable Laid Italian Sash.	19@20%
India Cable Laid Sash.	11@12%
Silver Lake—	
A quality, White, 50#.	25%
A quality, Drab, 55#.	25%
B quality, White, 30#.	10%
B quality, Drab, 35#.	10%
Sylvan Spring, Extra Braided, White, 34#.	
Semper Idem, Braided, White.	27@28%
Egyptian, India Hemp, Braided.	26%
Massachusetts, White.	29%

Samson—

Braided, White Cotton.	37%
Braided, Drab Cotton.	42%
Braided, Italian Hemp.	40%
Braided, Linen.	56%

Tate's Solid Braided—

Hercules, White.	25%
Hercules, Drab.	30%
Economy Drab.	27%
Economy White.	22%

Ossawa Mills—

Braided, Giant, White, 30#.	20%
Braided, Giant, Drab and Fancy, 30#.	25%

Braided, Crown White, 30#.**Braided, Crown Drab and Fancy, 30#.****Wire Picture—****Corkscrews—See Screws, Cork.****Corn Knives and Cutters****Crackers, Nut—**

Table (H. & B. Mfg. Co.)	40%
Blake's Pattern, 2 doz., \$2.00	10%
Turner & Seymour Mfg. Co.	50%
Acme.	
— Turned Base #20	50%

Cradles—

Japanned, 30 gro.	\$30	50%
Nickel Plated, 30 gro.	\$30.	10%
Grain.	50&5&2@50&10&2%	

Crayons—

ers', 30 gross, \$2.50.....	25%
D. M. Stewart Mfg. Co., Rolling Mill,	
30 gross, \$2.50.....	25%

See also *Chalk*.

Creamery Pails—See Pails, Creamery.**Crow Bars—See Bars, Crow.****Curry Combs—****Curtain Pins—****Cutters—****Meat—**

Dixon's, 1 doz.	40&5%
Nos. 1 2 3 4 5	
14.00 17.00 19.00 30.00	
Woodruff's, 1 doz.	100 40&5%
Nos. 1 2 3 4 5	
15.00 18.00	

Hale's Pattern, 30 doz.

Nos. 1 2 3 4 5	
27.00 33.00 45.00	
American.	30%
Nos. 1 2 3 4 5	
5 7 10 25 50 80	
Enterprise.	25%
Nos. 1 2 3 4 5	
10 12 22 32 42	
Each.	\$3 \$2.50 \$4 \$6 \$15

Great American Meat Cutter.

Nos. 1 2 3 4 5	
112 116 118 120 122	
Each.	\$2.00 \$2.75 \$3.00 \$3.50 \$4.00
Miles' Challenge, 30 doz.	\$45&45&10%
Nos. 1 2 3 4 5	
22.00 30.00 40.00	

Home No. 1, 30 doz., \$28.00.

Draw Cut, each:	
Nos. 1 2 3 4 5	
50 75 80 225 200	
Beef Shavers (Enterprise).	20&25%
Little Giant (P. S. & W. Co.).	50%
Chadborn's Smoked Beef Cutter, 30 doz.	\$66.00

Tobacco

Champion.	20&10@30%
Iron.	\$4.25
Nashua Lock Co.'s, 30 doz.	\$18.00, 50&55%
Wilson's.	55%
Sargent's.	20 doz., \$24.00, 55&10%
Acme.	20 doz., \$20.00, 40%

Washer—

Smith's Pat.	30 doz., \$12.00, 20&10&10%
Johnson's.	30 doz., \$11.00, 33&34%
Penny's.	30 doz., \$14.00, 16, 65%
Appleton's.	30 doz., \$18.00, 60&10%
Cincinnati.	25&10%

Dampers, &c.—

Dampers, Buffalo.	40&10%
Buffalo Damper Clips.	40&10%
Crown Damper.	40%
Excelsior.	40&10%

Diggers, Post Hole, &c.—

Samson, 30 doz., \$34.00.	25&25&10%
Fletcher Post Hole Augers, 30 doz.	\$28.00.
Bonney's.	20&20&10%
Eureka Diggers, 30 doz.	\$12.00@13.00
Vaughan's Post Hole Auger, 30 doz.	\$8.50@9.50

Kohler's Little Giant.

Kohler's Hercules.	30 doz., \$18.00
Kohler's Invincible.	30 doz., \$12.00
Kohler's New Champion.	30 doz., \$8.00
Schneider.	30 doz., \$18.00
Cronk's Post Bars, 30 doz.	\$80.00.

Gibbs' Post Hole Digger.

Gibbs' National.	30 doz., \$15.00
Gibbs' Columbia.	30 doz., \$12.00
Gibbs' Imperial.	30 doz., \$7.50
Shimer's Hollow Handle.	30 doz., \$24.00.

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Springs—****See Springs, Door.****Drawers.****Drawing Knives—****See Knives, Drawing.****Drills and Drill Stocks—**

Blacksmith's.	each \$1.75
Blacksmith's Self-Feeding, each \$7.50, 20%	
Preast, P. S. & W.	40&10%
Preast, Wilson's.	30&35%
Preast, Millers Falls.	each \$3.00, 25%
Preast, Bartholomew's.	each \$2.50, 25&10&40%

Ratchet, Merrill's.

Ratchet, Ingersoll's.	25%
Ratchet, Parker's.	20&20&5%
Ratchet, Whitney's.	20&10%
Ratchet, Weston's.	20&25%
Ratchet, Moore's Triple Action.	25&30%
Ratchet, Curtis & Curtis.	30%

Whitney's Hand Drill, Plain, \$11.00.

Adjustable, \$12.00.	20&10%
Automatic Boring Tools.	\$1.75@1.85
Chicopee Automatic Drill.	20&10%

Cleveland.

Diamond, W. & B.	50&10&10%
Graham's Pat. Groove Shank.	60&10&10%
Morse.	50&10&10%
New Process.	50&10&10%
Standard.	50&10&10%
Syracuse (Meta list).	50&10%

Twist Drills—

Diamond, W. & B.	50&10&10%
Graham's Pat. Groove Shank.	60&10&10%
Morse.	50&10&10%
New Process.	50&10&10%
Standard.	50&10&10%
Syracuse (Meta list).	50&10%

Drill Bits or Bit Stock**Drills—See Augers and Bits.****Drill Chucks—See Chucks.****Dripping Pans—****See Pans, Dripping.****Drivers, Screw—**

Douglas Mfg. Co.	20@20&10%
Disston's.	50%
Buck Bros.	30%
Stanley R. & L. Co.'s	

No. 64, Varnished Handles.

No. 86.	70&10%
Sargent & Co.'s	
No. 1, Forged Blade.	60&10&10%
Nos. 20, 40 and 60.	60&10&10%
P. S. & W.	70%

Knapp & Cowies

No. 1.	60&20@70%
No. 2.	60&10&10@70&5%
No. 3.	60&5&60&10%
Nos. 4 and 60, Acme and Ideal.	60&5%

Stearns'

Gay & Parsons.	35%
Champion.	25&10%
Clark's Pat.	30@33&34%
Crawford's Adjustable.	30%
Ellis's Socket and Ratchet.	25&25&10%
Ellis's Spiral, new list.	25%
Kolb's Common Sense.	30 doz., \$6.00.

Syracuse Screw-Drive Bits.

Screw Driver Bits.	50 doz., 50@75%
Screw Driver Bits, Farr's.	\$5.25
Farr's Hot, Edie Sets.	No. 3, \$12.00, 45%
P. D. & Co.'s All Steel.	50%
Cincinnati.	25&10%

Buck Bros' Screw Driver Bits.

Goodell's Automatic.	60%
Mayhew's Black Handle.	45&10%
Godwell's Monarch.	45&10%
C. T. Williamson Wire Novelty Co.	50%

Egg Beaters—See Beaters, Egg**Egg Poachers—****See Poachers, Egg.****Electric Bell Sets—****See Bells, Electric.****Emery—No. 1 to No. 54 to Flour, CF.**

46 gr.	150 gr.	F.F.F.
Kegs, 30 lb.	4 1/2	5 1/2
1/2 Kegs, 15 lb.	4 1/2	5 1/2
1/4 Kegs, 7 1/2 lb.	5	5 1/2
10 lb. cans, 10	6	6 1/2
10 lb. cans, less	than 10	10
than 10	10	7 1/2

Enameled and Tinned**Ware—See Ware, Hollow.****Escutcheon Pins—****See Pins, Escutcheon.****Escutcheons—**

Door Lock.	Same dis. as Door Locks.
Brass Thread.	60&60&10%
Wood.	25%

Expanded Metal—

List No. 5.	
Lathing.	10%
Fencing, Painted Sheets.	20%
Netting, Painted Sheets.	20%
Door Mats, Galvanized.	25%
Window Guards, Paneled.	15%
Tree Guards, Paneled.	15%

Extractors, Lemon Juice**See Squeezers, Lemon.****Fasteners, Blind—**

Macrell's, 30 doz., \$1.00.	20&20&10%
Van Sand's Screw Pat. \$15 1/2 gr.	60&10%
Van Sand's Old Pat. \$15 1/2 gr.	55&10%
Austin & Eddy No. 2008.	30 gr., \$9.00
Security Gravity.	30 gr., \$9.00
Zimmerman's.	50&10%

Faucets—

Justin & Eddy No. 2008.....	30 gr., \$
Security Gravity.....	30 gr., \$
Simmerman's.....	50

Faucets—

L & I. J. White.....

Conclusions

Brittan, Graham & Mathes, list Jan. 1893.
 Plate, 36x42x10 60x10x10
 Barnes Mfg. Co. 40x40x10
 Yale, net prices
 Delta Flat Key 30x
 Romer's Night Latches 15x
 Brooklyn Latches 50x10x10
 Warner's Burglar Proof, # doz. \$3.00, 50x

Padlocks—

List June 10, 1891.
 Norwich Lock Mfg. Co., old list. 50x2x
 Yale Lock Mfg. Co.'s, net prices
 Eagle, Eagle Lock Co. 40x
 Eureka, Eagle Lock Co. 40x2x
 Romer's Nos. 0 to 91. 30x
 Romer's Scandinavian, &c., Nos. 100 to 505. 15x
 A. E. Deltz. 40x
 Champion Padlocks. 40x
 Yotchkies. 80x
 Star. 40x
 Horseshoe. # doz \$9.50 50x50x10
 Barnes Mfg. Co. 40x40x10
 No. 3. 30x
 Scandinavian. 90x40x10
 E. F. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140. 90x10x
 Other Nos. 65x
 Ames Sword Co. up to No. 150. 40x
 Ames Sword Co. above No. 150. 50x
 Slaymaker, Barry & Co. No. 1010 line. 90x5x
 No. 41 line. 50x5x
 No. 61 line. 60x5x
 No. 21 line. 75x10x

Sash, &c.—

Clark's No. 1, \$10; No. 2, \$8 gr. 33x4x
 Ferguson's. 33x4x
 Victor. 60x10x2x
 Walker's. 10x
 Attwell Mfg. Co. 25x33x4x
 Reading. 60x10x2x 60x10x10x
 Hammond's Window Springs. 40x
 Common Sense, Jap'd, Cop'd and Br'd. gr \$4.00
 Common Sense, Nickel Plated. # gr \$4.00
 Universal. 30x
 Kempshall's Gravity. 60x
 Kempshall's Model. 60x60x10x
 Corbin's Daisy, list Feb. 15, 1890. 70x
 Payson's Perfect. 60x10x10x
 Huginin's Sash Balances. 25x5x2x
 Huginin's New Sash Locks. 25x5x2x
 Ives Patent. 60x10x2x 60x10x10x
 Fish (Liesche's pat.), No. 100, # gr. \$8;
 No. 105, # gr. \$10. 50x
 Davis, Bronze, Barnes Mfg. Co. 50x
 Champion Sash List January, 1893. 70x5x
 Security. 70x
 Giant, list Jan., 1892. 70x5x
 Wolcott's. 60x10x5x
 Monarch. 50x

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles. # doz, \$1.75; # gross. \$17.00

Machines.

Boring—

Without Augers. Upright. Angular.
 Douglas. \$5.50 \$6.75. 50x
 Snell's, Rice's Pat. 5.50 6.75 40x10x10x
 Jennings. 5.50 6.75 45x10x10x
 Other Machines. 2.35 2.75.
 Phillips' Patent with Augur. 7.00 7.50.
 Miller's Falls. 7.50 25x

Fluting—

Knox, 4 1/2-inch Rolls. \$3.25 each } 35x
 Knox, 6-inch Rolls. \$3.60 each }
 Eagle, 3 1/2-inch Rolls. \$2.15. 35x
 Eagle, 5 1/2-inch Rolls. \$2.85. 35x
 Crown, 4 1/2 in. \$3.50; 6 in. \$4.00; 8 in. \$6.50 each.
 Crown Jewel, 6 in. \$5.50 each. 35x
 American, 5 in. \$3.00; 6 in. \$3.40; 7 in. \$4.50 each. 35x
 Domestic Fluter. 35x
 Geneva Hand Fluter, White Metal. # doz \$12.25x
 Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00. 20x
 Shepard Hand Fluter, No. 85, per doz \$15.50.
 Shepard Hand Fluter, No. 110, # doz \$11.00.
 Shepard Hand Fluter No. 96, # doz \$8.00.
 Combined Fluter and Sad Iron. 40x
 Buffalo, # doz \$10.00. 10x

Hoisting—

Moore's Hand Hoist, with Lock Brake. 20x
 Moore's Differential Pulley Block. 40x
 Energy's Mfg. Co.'s. 25x
 Sure Grip Steel Tackle Blocks. 25x

Washing—

Anthony Wayne, # doz, No. 1, \$51; No. 2, \$45; No. 3, \$42.
 Western Star # doz, No. 2, \$45; No. 2 \$48.
 Wells. # doz \$54.00
 Fair and Square. # doz \$42.00

Mallets—

Hickory. 20x10x10x20x10x10x
 Lignumvite. 20x10x10x20x10x10x
 S. & L. Block Co., Hickory & L. V. 30x30x10x

Mattocks—Regular list.

60x10x60x10x5x

Measures—

Standard Fiberware, No. 1, peck # dozen, \$3.50; 1/2 peck, \$3.00.

Meat Cutters—

See Cutters Meat.

Menders, Harness—

Per doz. \$2.00

Milk Cans—See Cans, Milk.

Mills—

Coffee—

Box and Side, list Jan. 1, 1888. 60x60x10x
 Net prices are often made which are lower than above discount.
 American, Enterprise Mfg. Co., list Jan. 17, 1893. 20x
 The Swift, Lane Bros. 30x

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Best Machines: 10-in., \$4; 12-in., \$4.50; 14-in., \$5; 16 in., \$5.50; 18-in., \$6
 Low-Grade Machines:
 10-in. \$3; 12-in., \$3.25; 14-in., \$3.50 each

Muzzles—

Safety. # doz, \$3.00, 25x

Nails.—

Cut and Wire. See Trade Report.
 Wire Nails, Papered.
 Association list, May 1, 192. 80x10x10x5x
 Tack Mfrs.' list. 70x5x70x10x10x
 Hungarian, Finishing, &c. See Tacks.

Horse—

Nos. 6 7 8 9 10
 American. 8x 8x 8x 8x 8x net
 Ausable. 25x 25x 25x 25x 25x
 Clinton, Fin. 19x 17x 16x 15x 14x 30x10x
 Essex. 28x 26x 25x 24x 23x
 Lyra. 19x 17x 16x 15x 14x 40x10x
 Snowden. 19x 17x 16x 15x 14x 40x10x
 Vulcan. 23x 21x 20x 19x 18x 25x
 Northwest'n. 25x 23x 22x 21x 20x
 A. C. 25x 23x 22x 21x 21x
 C. B. K. 25x 23x 22x 21x 21x
 Maud S. 25x 23x 22x 21x 21x
 Champlain. 28x 26x 25x 24x 23x
 Saranac. 23x 21x 20x 19x 18x 40x5x
 Champion. 25x 23x 22x 21x 20x
 Capewell. 19x 18x 17x 16x 15x 10x5x
 Anchor. 23x 21x 20x 19x 18x 35x
 Western. 23x 21x 20x 19x 18x 50x
 Empire Bronzed. 13x14 50x

Picture—

Brass Head, Sargent's list. 60x60x10x
 Brass Head, Combination list. 50x10x
 Porcelain Head, Sargent's list. 50x10x10x
 Porcelain Head, Combination list. 40x10x
 Niles' Patent. 40x

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Square. Hex.
 Hot Pressed. 5.80x 6.50x off list
 Cold Funched. 5.00x 6.10x off list
 In packages of 100 #, add 1-10¢ # #
 net; in packages less than 100 #, add 1/2¢ # #, net.

Oakum—

Best or Government. # # 6x4 7x4
 U. S. Navy. # # 5x4 6x4
 Navy. # # 5x4 6x4

Oil Tanks—See Tanks, Oil.

Oilers—

Zinc and Tin. 65x10x70x5x
 Brass and Copper. 50x10x50x10x5x
 Malleable, Hammers' Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40. 10x
 Malleable, Hammers' Old Pattern, same list. 10x
 Prior's Pat. or "Paragon" Zinc. 60x10x10x
 Prior's Pat. or "Paragon" Brass. 50x
 Hinstead's Tin and Zinc. 60x
 Orchested's Brass and Copper. 60x
 Broughton's Zinc. 60x
 Broughton's Brass. 60x
 Gem, P. D. & Co. # gro. \$2
 Steel, Draper & Williams. 60x

Openers, Can—

Messenger's Comet. # doz \$3.00, 25x
 American. # gross \$2.75 \$3.00
 Duplex. # doz \$2.5x, 15x20x
 Lyman's. # doz \$3.75, 20x
 No. 4, French. # doz \$2.25, 55x60x
 No. 5, Iron Handle. # gr \$6.00, 45x60x
 Eureka. # doz \$2.50, 10x
 Sardine Scissors. # doz \$2.75 \$3.00
 Star. # doz \$2.75
 Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50. 60x70x
 Excelsior, No. 1 \$2.50; No. 2, \$1.50. 40x
 World's Best. # gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00. 50x10x
 Universal. # doz \$3.00. 55x5x
 Domestic. # doz \$2.00. 45x
 Champion, # doz \$2.00. 50x

Packing, Steam—

Rubber—

Standard. 70x70x10x
 Extra. 60x60x5x
 N. Y. B. & P. Co. Standard. 50x
 N. Y. B. & P. Co. Empire. 60x
 N. Y. B. & P. Co. Salamander. 25x
 Jenkins' Standard, # # 80x. 25x25x5x

Miscellaneous—

American Packing. 10x11x # #
 Russia Packing. 14x # #
 Italian Packing. 13x14x # #
 Cotton Packing. 15x17x # #
 Jute. 7x8x # #

Pails—

S. S. & Co.: 18-qt., \$7.00; 20-qt., \$7.25 per doz. 5x

Galvanized—

Quarts 10 12 14
 Hill's Light Weight, # doz. \$2.75 3.00 3.25
 Hill's Heavy Weight, # dz. 3.00 3.25 3.75
 Helwig's. 2.50 2.75 3.00
 Sidney Shepard & Co. 2.35 2.85 3.05
 Iron Clad. 2.50 2.75 3.00
 Fire Buckets. 2.75 3.25 3.50
 Buckets—See Well Buckets.

Indurated Fiber Ware—25x

Star Pails, 12 qt. # doz \$4.20
 Milk, 14 qt. # doz \$5.40
 Stable, 14 qt. # doz \$6.00
 Fire Pails, deep. # doz \$4.80
 Fire Pails, round bottom. # doz \$5.40

Standard Fiber Ware—

Water Pails, 12 qt. # doz. \$3.60 \$4.00
 Dairy Pails, 14 qt. # doz. 4.00 4.60
 Fire Pails, No. 1, 12 qt. # doz 4.00
 Fire Pails, No. 2, 14 qt. # doz 4.50
 Sugar Pails. 5.50 6.00
 Horse Pails. 4.50
 Buggy Pails. 3.50
 Slop Jars (bal. trap). 7.50 8.50
 Chamber Pails, 14 qt. 6.00 7.00

Pans—

Dripping—

Small sizes. # # 5x4x
 Large sizes. # # 5x6x
 Silver & Co. (Covered). 40x

Fry—

Standard List:
 # doz. \$3.00 \$3.75 \$4.25 4.75 \$5.25
 No. 1. 5 6 7 8
 # doz. \$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods. 75x75x10x
 Acme Fry Pans. 60x6x

Dust—

Steel Edge, No. 1. # doz \$1.75

Roasting and Baking—

Columbia, S. S. & Co.: Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each. 50x

Paper and Cloth—

Sand and Emery—

List April 19, 1886. 50x10x50x10x5x
 Sibley's Emery and Crocus Cloth. 30x

Parers—

Apple—

Advance. # doz \$4.75
 Baldwin. # doz \$5.25
 Bonanza. # doz 5.00
 Daisy. # doz 4.00
 Dandy. # doz 7.50
 Eclipse. # doz 4.25
 Eureka, 1888. # doz 18.00
 Family Day State. # doz 12.00
 Favorite. # doz 5.00
 Gold Medal. # doz 4.00
 Ideal. # doz 4.00
 Improved Bay State. # doz 27.00 \$30.00
 Little Star. # doz 4.50
 Monarch. # doz 13.50
 No. 1. # doz 5.50
 Oriole. # doz 4.00
 Penn. # doz 4.00
 Perfection. # doz 4.00
 Pomona. # doz 4.00
 Rocking Table. # doz 6.00
 Turn Table. # doz 4.50
 Victor. # doz 13.50
 Waverly. # doz 4.00
 White Mountain. # doz 4.00
 72. # doz 4.25
 78. # doz 7.00

Potato—

White Mountain. # doz \$4.50
 Antrim Combination. # doz \$5.50
 Hoosier. # doz \$13.50
 Saratoga. # doz \$5.50

Pencils—

Faber's Carpenters'. high list 50x
 Faber's Round Gilt. # gro. \$5.25
 Dixon's Lead. # gro \$4.50
 Dixon's Lumber. # gro \$6.75
 Dixon's Carpenters'. 10x

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00. 60x10x60x10x10x

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Bow—

Humason, Beckley & Co.'s. 60x10x
 Sargent & Co.'s, \$17 and \$18. 60x10x
 Peck, Stow & W. Co. 50x10x50x10x5x

Curtain—

Silvered Glass. net
 White Enamel. net

Escutcheon—

Iron, list Nov. 11, 1885. 50x10x50x10x5x
 Brass. 60x60x5x

Pipe, Wrought Iron—

List October 12, 1892.
 1 1/2 and under, Plain. 60x10x
 1 1/2 and under, Galv. 52x6x10x
 1 1/2 and over, Plain. 70x10x
 1 1/2 and over, Galv. 60x10x
 Boiler Tubes, list Oct. 24, 1892. 65x10x
 Casing, list Nov. 16, 1892. 52x6x10x
 Inserted Joints Casing, list Nov. 16, 1892. 47x6x5x
 Steel Boiler Tubes. 27x6x5x
 Cold Drawn Seamless Steel Tubing. 50x

Planes and Plane Irons—

Wood Planes—

Molding. 40x40x10x
 Bench, First quality. 45x45x10x
 Bench, Second quality. 50x50x10x
 Bailey's (Stanley R. & L. Co.). 50x10x

Iron Planes—

Bailey's (Stanley R. & L. Co.). 50x10x
 Miscellaneous Planes (Stanley R. & L. Co.). 25x10x
 Steers' Iron Planes. 50x60x5x
 Meriden Mal. Iron Co.'s. 50x60x5x
 Davis' Iron Planes. 50x60x5x
 Birmingham Plane Co. 60x60x5x
 Gage Tool Co.'s Self-Setting. 20x10x10x
 Chaplin's Iron Planes. 50x60x5x
 Sargent's. 60x60x10x
 Standard Tool Co. 60x60x5x

Plane Irons—

Butcher's. \$5.00 \$5.25 to \$5
 Buck Bros. 30x
 Auburn Thistle. 30x10x
 Olio. 30x10x
 Sandusky. 30x
 L. & I. J. White. 25x
 Stanley R. & L. Co. 50x10x

Plates—

Fellows. # # 6x6x6x

Pliers and Nippers—

Button's Patent. 60x
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in. \$21.00 # doz.
 Humason & Beckley Mfg. Co. 50x50x10x
 Lindsay's Giant. 33x
 Gas Pliers. 60x
 Gas Pliers, Custar's Nickel Plated. 60x5x
 Eureka Pliers and Nippers. 40x
 Russell's Parallel. 25x
 P. S. & W. Cast Steel. 50x
 P. S. & W. Tinnars' Cutting Nippers. 10x
 Carew's Pat. Wire Cutters. 20x
 Morrill's Parallel, # doz, \$12.00. 30x5x
 Cronk's 5 in., \$15.00; 10 in., \$21.00. 50x60x5x
 Cronk's Button Pattern. 50x10x60x
 Cronk's Carrier Pliers. 60x60x5x

Plumbs and Levels—

Regular List. 75x10x75x10x5x
 Stanley's Duplex. 20x10x
 Stanley's Handy. 20x10x
 Diston's. 50x
 Pocket Levels. 70x10x70x10x10x
 Davis Iron Levels. 40x10x

Poachers, Egg—

Buffalo Steam Egg Poachers, # doz, No. 1, \$6.00; No. 2, \$9.00. 33x4x
 Silver & Co., 6-Ring, # doz, \$4.00; 8-Ring. \$2.00

Pokes, Animal—

Bishop s I. X. L. # doz \$6.00
 Bishop's O. K. # doz \$5.25
 Bishop's Pioneer. # doz \$3.75
 Bishop's American. # doz \$2.75
 Eagle, Double Stale. # doz \$5.75
 Eagle, Single Stale. # doz \$3.75
 Buckeye, Single Stale. # doz \$2.75
 Bolding. # doz \$6.00
 Metallic Horse Pokes. # doz. \$6.00

Police Goods—

R. I. Tool Co., Handcuffs, \$15.00 # doz 10x
 R. I. Tool Co., Leg Irons, \$25.00 # doz 10x
 Towlers. 25x
 Daley's Improved Handcuffs, 2 Hands, Polished, # doz, \$48.00; Nickle, \$57.00; 3 hands, Polished, # doz, \$72.00; Nickle, \$84.00.
 J. P. Lovell's Police Goods. 25x

Polish—

Metal—

Prestoline. 30x
 Prestoline Paste. 33x4x
 Gaston's Silver Compound. 33x4x

Stove—

Joseph Dixon's. # gro, \$6.00, 10x
 Gem. # gro, \$4.50, 10x
 Gold Medal. # gro, \$6.00, 25x
 Jaisro. # gro, \$6.00, 25x
 Ruby. # gro, \$3.75
 Rising Sun, 6 gro lots. # gro \$5.50
 Dixon's Plumbago. # # 8x
 Boynton's Noon Day. # gro \$13.00
 Parlor Pride Stove Enamel, # gro
 Yates' Liquid, 2 3 6 10 gal
 # \$10.80 \$0.80 \$2.00 \$10.00
 Yates Standard Paste Polish, 10 # cans, # 12x4x
 Jet Black.

Tubular Steel..... 6 doz \$24.00 4025
(Lots of 6 doz 50%)

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)	65¢
Flash (Gristol)	50¢10¢
Hotchkiss	10¢
Andrews	50¢
Sargent's Patent Guarded	70¢10¢10¢
German, new list	40¢10¢
Covert	50¢10¢5¢2¢
Covert, New Patent	50¢10¢5¢2¢
Covert, New E. E.	60¢10¢5¢2¢
Covert Spring	60¢10¢5¢2¢
Covert's Saddlery Works' Triumph	33¢4¢
John Protz Snaps	75¢75¢5¢

Snaths. Scythe

List	50¢50¢5¢
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Soldering IronsSee *Irons, Soldering.***Spittoons, Cuspidors, &c.****Standard Fiberware**

Cuspidors, 8½-inch, # doz., No. 5, 8; No. 5, 8	
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, 8¢	

Spoke ShavesSee *Shaves, Spoke.***Spoke Trimmers**See *Trimmers, Spoke.***Spoons and Forks****Tinned Iron**

Basting, Cen. Stamp. Co.'s list	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list	70¢10¢
Buffalo, S. S. & Co.	33¢4¢2¢

Silver Plated

months or 5¢ cash 30 days:	
Meriden Brit. Co., Rogers	40¢15¢
O. Rogers & Bros.	40¢15¢
Rogers & Bros.	40¢15¢
Reed & Barton	40¢40¢5¢
Wm. Rogers Mfg. Co.	40, 15¢5¢
Simpson, Hall, Miller & Co.	40, 15¢5¢
Holmes & Edwards Silver Co.	40, 15¢5¢
L. Boardman & Son	50¢12¢4¢

Miscellaneous

Holmes & Edwards Silver Co.	
No. 67 Mexican Silver	50¢10¢5¢
No. 30 Silver Metal	50¢10¢5¢
No. 24 German Silver	50¢10¢5¢
No. 50 Nickel Silver	50¢5¢
No. 49 Nickel Silver	50¢10¢5¢
Wm. Rogers Mfg. Co.	
Rogers' Silver Metal	50¢10¢5¢
18¢ Rogers' German Silver	50¢8¢
25¢ Rogers' Nickel Silver	50¢8¢
German Silver	50¢8¢
German Silver, Hall & Elton	50¢5¢ cash
Nickel Silver	50¢5¢10¢10¢5¢ cash
Britannia	60¢60¢5¢
Boardman's Nickel Silver, list July 1, 1891	60¢75¢5¢
Boardman's Britannia Spoons, cash lots	60¢25¢ cash

Spring**Door**

Torrey's Rod, 39 in.	doz \$1.20@1.2
Warner's No. 1, # doz	\$1.50; No. 2, \$3.40
Gem (Coli), list April 19, 1886	20¢
Star (Coli), list April 19, 1886	20¢10¢
Victor (Coli)	60¢10¢60¢10¢5¢
Champion (Coli)	60¢10¢60¢10¢10¢
Cowell's, No. 1, # doz	\$1.00; No. 2, \$1.50
Rubber, complete, # doz	\$4.50; 55¢10¢
Hercules	50¢60¢10¢

Carriage, Wagon, &c.

Elipitic, Concord, Platform and Half	
Roll, 60¢10¢10¢10¢ or net prices	
Cliff's Bolster Springs	25¢

Squares

Steel and Iron	85¢85¢5¢
Nickel-Plated	60¢10¢10¢
Try Square and T Bevels	60¢10¢10¢
Disston's Try Square and T Bevels	50¢
Winterbottom's Try and Miter	30¢10¢
Starrett's Micrometer Caliper Squares	25¢
Avery's Flush Bevel Squares	40¢
Avery's Bevel Protractor	50¢

Squeezers**Fodder**

Blair's "Climax"	doz \$2.00
Blair's "Climax"	doz \$1.25

Lemon

Porcelain Lined, No. 1	doz \$3.00
Wood, No. 2	25¢30¢
Wood, Common	doz \$3.00, 35¢
Dunlap's Improved	doz \$1.70@1.75
Samms, No. 1, \$5.00; No. 2, \$3; 12, 18	doz
Jennings' Star	doz \$2.50
The Boss	doz \$2.50
Dean's, Nos. 1, # doz	\$6.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50
Little Giant	50¢50¢5¢
King	40¢5¢
Hotchkiss Straight Flash	doz \$12.00
Silver & Co., Glass	gro. \$9.00
Manny Lemon Juice Extractor	doz \$0.75@1.00
Standard Improved	doz \$2.00

Standard Fiber WareSee *Ware, Standard Fiber.***Staples**

Barbed Blind, ¼ in. and larger	# 7@7¼¢
Barbed Blind, ¼ in.	# 8@8¼¢
Fence Staples, Galvanized	Same price
Fence Staples Plain	as #7B Wire
Grand Crossing Tack Co.'s list	75¢10¢

Steelyards**Stocks and Dies**

Blacksmith's	
Waterford Goods	35¢
Butterfield's Goods	35¢
Lightning Screw Plates	25¢30¢
Bece's New Screw Plates	25¢30¢
Reversible Ratchet	30¢
Gardner	25¢
Green River	25¢30¢

Stops, Bench

Morrill's	doz \$9, 50¢
Hotchkiss's	doz \$5, 10¢10¢10¢
Weston's, No. 1, #10; No. 2, #9, 25¢10¢5¢	

McGill's, # doz \$3.

Cincinnati	25¢10¢
Terrell's Nos. 1 and 2, # doz, #3; No. 3	\$3.60

Stone**Stones, Grind—See Grindstones.****Scythe Stones**

Pike Mfg. Co., list April, 1892	33¢4¢
Cleveland Stone Co., list Nov. 1892	33¢4¢

Oil Stones, &c.

Pike Mfg. Co.	
Hindustan No. 1, # D.	8¢
Sand Stone	5¢
Turkey Oil Stone, 4 to 8 in	40¢40¢
Turkey Slips	\$2.00
Washita Stone, Extra	50¢
Washita Stone, No. 1	40¢
Washita Stone, No. 2	30¢
Washita Stone, Extra	80¢
Washita Slips, No. 1	70¢
Arkansas Stone, No. 1, 3 in	\$5.30
Arkansas Stone, No. 1 5½ to 8 in	\$3.50 30¢40¢
Lake Superior	# D 13¢
Lake Superior Slips	# D 20¢

Stove PolishSee *Polish, Stove.***Stretchers Carpet**

Cast Steel, Polished	doz \$2.2
Cast Iron, Steel Points	doz \$75@80¢
Socket	doz \$1.75
Bullard's	25¢25¢10¢

Strops, Razor

Genuine Emerson	60¢60¢5¢
Imitation	doz \$2.00, 20¢10¢5¢
Torrey's	20¢
Badger's Belt and Com.	doz \$2.00
Lamont Combination	doz \$4.00
Jordan's Pat. Padded, list Nov. 1, '89	50¢
Electric Cutlery Co.	Net
Campbell Cutlery Co.	Net

Stuffer, Sausage

Miles' Challenge, # doz	\$20, 50¢50¢5¢
Perry, # doz, No. 1, \$15.00; No. 0, \$21.00	50¢50¢10¢10¢
Draw Cut No. 4, each	\$30.00, 20¢
Enterprise Mfg. Co., list Jan. 17, '93	25¢

Sweepers, Carpet and Lawn**Carpet**

Bissell No. 5	doz \$17.00
Bissell No. 8	doz \$20.00
Bissell, Grand	doz \$38.00
Standard	doz \$24.00
Domestic	doz \$21.00
Domestic, No. 2	doz \$22.00
Grand Rapids	doz \$24.00
Crown Jewel, No. 1	\$18.00; No. 2, \$19.00; No. 3, \$20.00
Magie	doz \$15.00
Improved Parlor Queen	
Nickel	doz \$27.00
Jannaped	doz \$24.00
Excelsior	doz \$22.00
Garland	doz \$18.00
Parlor Queen	doz \$24.00
Housewife's Delight	doz \$15.00
Ladies' Friend	doz \$15.00
Ladies' Friend No. 2	doz \$16.00
Advance	doz \$18.00
Trip Leader	doz \$20.00
Triumph	doz \$21.00
Goshen	doz \$21.00
Supreme	doz \$22.00
Easy	doz \$22.00
Gilt Edge	doz \$24.00
Acme	doz \$28.00
Imperial	doz \$28.00
Grand Republic	doz \$30.00
Banner	doz \$22.00
The Star	doz \$21.00
Reliable	doz \$22.00
The Rapid	doz \$22.00
Our Own	doz \$27.00
Model	doz \$27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:	
5 dozen in 6 months	doz \$1.00
10 dozen in 6 months	doz \$2.00
25 dozen in 6 months	doz \$3.00
Except on L.F. when 10 dozen price is \$13.50, and 25 dozen \$13.00.	

Lawn

Thompson Mfg. Co.	30¢
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Swings

Davies Lawn	25¢
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Tacks, Brads &c.

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

American, Blued	60¢4¢
American, Tind and Cop'd	70¢
Steel, Bright and Blued	60¢4¢
Steel, Tinned and Coppered	70¢
Swedes Iron, Blued	72¢4¢
Swedes Iron, Tinned	75¢
American Iron Tacks, Domestic	60¢4¢
Swedes Iron Tacks	
S. S., Blued	60¢4¢
S. S., Tinned	70¢
Lanc., Blued	55¢
Lanc., Tinned	60¢
Gimp and Lace Tacks	62¢4¢
S. S., Blued	62¢4¢
S. S., Tinned	66¢4¢
Lanc., Blued	55¢
Lanc., Tinned	60¢
Basket and Trimmers' Tacks	
Lanc.	52¢4¢
S. S.	60¢
Hungarian Nails	60¢
Common and Patent Brads	55¢
Leathered Tacks	10¢
Brush Tacks, S. S.	60¢
Looking Glass Tacks, S. S.	35¢
Picture-Frame Points, S. S.	35¢
Finishing Nails	60¢
Trunk and Ciot Nails	
Black	62¢4¢
Tinned or Coppered	66¢4¢
Basket Nails	60¢
Chair Nails	52¢4¢
Cigar Box Nails	45¢
Tia Capper Nails	50¢

Miscellaneous

Double Point	90¢90¢10¢
Wire Carpet Nails	50¢10¢
Claw Handle Carpet	gross \$4.00
Bonnie Blue	box 1.50

Bill Nye Brad Box

Parisian Gilt Nails, cartoon	4.00
Home Tacks, No. 50 # case (12 cartons), \$36.00; No. 100, # case (12 cartons), \$72.00	
Home Nails, No. 200, # case (12 cartons), \$30.00; No. 400, # case (12 cartons), \$60.00	
Upholsterers' Nails	50¢

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list	50¢10¢
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See also *Nails, Wire.***Tanks, Oil**

Emerald, S. S. & Co.: 30-gal. \$8.75; 60-gal. \$11 each	50¢10¢
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Tapes, Measuring

American	40¢40¢5¢
Spring	40¢
Chesterman's, Regular list	25¢30¢

Thermometers

Tin Case	80¢80¢10¢
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Thimble Skeins—See Skeins.**Ties, Bale—Steel.**

Standard Wire, list	60¢10¢5¢
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Tinners' Shears, &cSee *Shears, Tinners' &c.***Tinware**

Stamped, Jannaped and Pleced, list Jan. 20, 1887	70¢10¢70¢25¢
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Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.**Tobacco Cutters**See *Cutters, Tobacco.***Tools****Coopers'**

Bradley's	20¢
Barton's	20¢20¢5¢
L. & J. White	20¢5¢
Alberson Mfg. Co.	30¢
Sandusky Tool Co.	30¢30¢5¢
Shaves Cincinnati Tool Co.	20¢

Lumber

Ring Peavies, "Blue Line"	# doz \$20.00
Ring Peavies, Common	# doz \$18.00
Steel Socket Peavies	# doz \$21.00
Mail Iron Socket Peavies	# doz \$19.00
Cant Hooks, "Blue Line"	# doz \$16.00
Cant Hooks, Common Finish	# doz \$14.00
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish	# doz \$14.50
Cant Hooks, Mail Socket Clasp, Common Finish	# doz \$14.00
Cant Hooks, Clip Clasp, Common Finish	# doz \$12.00
Hand Spikes	# doz 6 ft., \$15.00; 8 ft., \$20.00
Pike Poles, Pike & Hook	# doz, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only	# doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00
Pike Poles, not ironed	# doz, 12 ft., \$12.00; 14 ft., \$13.00; 16 ft., \$15.00; 18 ft., \$18.00; 20 ft., \$21.00
Setting Poles	# doz, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
Swamp Hooks	# doz \$18.00

Saw

Atkins', new list	40¢
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Transom LiftersSee *Lifters, Transom.***Traps****Game**

Newhouse	40¢40¢5¢
Onelda Pattern	70¢10¢
Game, Blake's Patent	40¢10¢5¢

Mouse and Rat

Mouse Wood, Choker, # doz holes, 9@10¢	
Mouse, Round Wire	# doz \$1.50 10¢
Mouse, Cage, Wire	# doz \$2.50 10¢
Mouse, Catch-em-alive	# doz \$2.50 15¢
Mouse, Bonanza	# doz 0.90@1.00
Rat, Decoy	# gr \$10.00, 10¢
Ideal	# gr \$10.00
Cyclone	# gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps	# doz, 75¢; in full cases, # doz.60¢65¢
Hotchkiss Imp. Rat Killer	# gro \$18.50
Hotchkiss New Rat Killer	# gro \$16.50
Schuyler's Rat Killer	# gro \$15.00
Dandy	# doz, \$1.75

Trimmers

Butter and Cheese	25¢
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Trimmers, Spoke

Bonney's	# doz \$10.00, 50¢
Stearns	20¢10¢
Ives', No. 1, \$15.00; No. 2, \$12.00	# doz
Douglas's	# doz \$9.00, 20¢
Cincinnati	25¢

Trowels

Lothrop's Brick and Plastering	20¢10¢5¢35¢
Reed's Brick and Plastering	15¢
Disston's Brk and Plastering	25¢25¢10¢
Peace's Plastering	25¢25¢5¢
Clement & Maynard's	20¢20¢5¢

Whips

American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
I. X. L. Whalebone Driving...	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone...	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whalebone...			11.00	12.00	13.00	15.00		
American Standard...	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center...	6.00	6.00	6.50	7.00	7.50	9.00		
New Name, Stocked Java, Black and Wine Colors...				6.00				
Americus, 33 Pen Whip...				6.00				
Gents' Light Driving No. 111...				6.00				
Gents' Light Driving No. 108...				6.00				
Hand-made Stocked Java No. 103...			3.75					
A large variety of cheaper grades...								
Team Whips...								
Toy Whips...								
Hardware Assortment, 10/American, 75 Whips for \$50.00.								

Wire and Wire Goods—**Iron—****Market,**

Br. and Ann. Nos. 0 to 18.		
75&100/75&100/50		
Cop'd, Nos. 0 to 18, 75&50		
Galv., Nos. 0 to 18, 75&50		
70&50/70&100		
Tin'd, Tin'd list, Nos. 0 to 18		
70&50/70&100		

Stone, Br. and Ann'd, Nos. 16 to 18.		
Bright and Ann'd, Nos. 19 to 26.		
Br. and Ann'd, Nos. 27 to 36.		
Tinned Broom Wire, 18 to 21.		
Galvanized Fence, Brass, list Jan. 18, 1884.		
Copper, list Jan. 18, 1884.		
Annealed Wire on Spools.		

Malin's An'aled & Tin'd on Spools.		
Malin's Brass and Cop. on Spools.		
Tate's Spooled, Tin'd & Annealed.		
Tate's Spooled Cop. and Brass.		
Cast Steel Wire.		
Stub's Steel Wire.		
Steel Music Wire, 12 to 30, imported.		
Wire Clothes Line, see Lines.		
Wire Picture Cord, see Cord.		
Bright Wire Goods—		
Standard list.		
Wire Cloth and Netting—		
Painted Screen Cloth, good quality.		
Galvanized Wire Netting.		

Wire, Barb—

See Trade Report.

Wire Rope—See Rope, Wire.**Wrenches—**

American Adjustable		
Baxter's Adjustable "S"		
Baxter's Diagonal		
Coe's Genuine		
Coe's "Mechanics"		
Girard Standard		
Lamson & Sessions' Engineers'		
Lamson & Sessions' Standard		
P. S. & W. Agricultural		
Girard Agricultural		
Lamson & Sessions' Agric'l.		
W. & B. Diamond		

Bemis & Call's:		
Pat. Combination		
Merrick's Pattern		
Briggs's Pattern		
Cylinder or Gas Pipe		
No. 3 Pipe		
Alken's Pocket (Bright)		
The Favorite Pocket		
Webster's Pat. Combination		
Boardman's		
Always Ready		
Alligator		
Donohue's Engineer		
Eagle		
Acme, Bright		
Acme, Nickel		
Hercules		
Walker's		
Diamond Steel		
Cincinnati Brace Wrenches		
Taft's Vise Wrench		

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93.		
Colby Wringer Co., list Sept. 1, '91.		
Lovell Mfg. Co., list Jan. 1, 1892.		
Peerless Mfg. Co., list Feb. 1, 1892.		
National Wringer & Mfg. Co., list June 1, 1892.		

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892.		
85&100/85&150		

Paints, Oils and Colors.—Wholesale Prices.**Animal and Vegetable****Oils—**

Linseed, City, raw, per gal.		
Linseed, City, boiled		
Linseed, Western, raw		
Lard, City, Extra Winter		
Lard, City, Prime		
Lard, City, Extra No. 1		
Lard, City, No. 1		
Lard, Western, prime		
Cotton-seed, Crude, off grades		
Cotton-seed, Crude, off grades		
Cotton-seed, Summer Yellow, prime		
Cotton-seed, Summer Yellow, off grades		
Sperm, Crude		
Sperm, Natural Spring		
Sperm, Bleached Spring		
Sperm, Natural Winter		
Sperm, Bleached Winter		
Whale, Crude		
Whale, Natural Winter		
Whale, Bleached Winter		
Whale, Extra Bleached		
Sea Elephant, Bleached		
Winter		
Menhaden, Crude, Sound		
Menhaden, Crude, Southern		
Menhaden, Light Pressed		
Menhaden, Bleached Winter		
Menhaden, Extra Bleached		
Tallow, City, prime		
Tallow, Western, prime		
Cocoanut, Ceylon		
Cocoanut, Cochinchina		
Cod, Domestic		
Cod, Foreign		
Red Elaine		
Red Saponified		
Bank		
Straits		
Olive, Italian, bbls.		
Neatsfoot, prime		
Palm, prime, Lagos		

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test.		
Black, 29 gravity, 15 cold test.		
Black, 29 gravity, summer.		
Cylinder, light, filtered.		

Cylinder, dark, filtered		
Paraffine, 23 1/2 @ 24 gravity		
Paraffine, 25 gravity		
Paraffine, 28 gravity		
Paraffine, red		

Paints and Colors—

Barytes, Foreign, 10 ton		
Barytes, Amer. floated		
Barytes, Amer. No. 1		
Barytes, Amer. No. 2		
Barytes, Amer. No. 3		
Blue, Celestial		
Blue, Chinese		
Blue, Prussian		
Blue, Ultramarine		
Brown, Spanish		
Brown, Vandyke, Amer.		
Brown, Vandyke, English		
Carmine, No. 40, in bulk		
Carmine, No. 40, in boxes or barrels		
Carmine, No. 40, in ounce bottles		
Chalk, in bulk		
Chalk, in bbls.		
China Clay, English		
Cobalt Oxide, prep'd		
Cobalt Oxide, black		
Cobalt Oxide, black		
Green, Paris, in bulk		
Green, Paris, 170 @ 175		
Green, Paris, small pack		
Green, Chrome, ordinary		
Green, Chrome, pure		
Lead, Eng. B.B. white		
Lead, Ann. White, dry or in oil		
Kegs, lots less than 500 lb.		
Kegs, lots 500 lb. to 5 tons		
Kegs, lots 5 tons to 12 tons		
Kegs, lots 12 tons and over		
Lead, White, in oil, 25 lb tin		
Lead, White, add to keg price		
Lead, White, in oil, 12 1/2 lb tin		
Lead, White, add to keg price		
Lead, White, in oil, 5 lb as sorted tins, add to keg price		
Lead, Red, bbls. and 1/2 bbls.		
Lead, Red, kegs		
Litharge, kegs		
Litharge, bbls. and 1/2 bbls.		

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle		
Ocher, French Washed		
Ocher, German Washed		
Ocher, American		
Orange Mineral, English		
Orange Mineral, French		
Orange Mineral, German		
Orange Mineral, American		
Paris White, English Cliff		
Paris White, American		
Red, Indian, English		
Red, Indian, American		
Red, Turkey		
Red, Tuscan		
Red, Venetian, American		
Red, Venetian, English		
Sienna, Italian, Burnt and		
Powd.		
Sienna, Ital. Burnt Lumps		
Sienna, Ital. Raw, Powd.		
Sienna, Ital. Raw, Lumps		
Sienna, American, Raw		
Sienna, American, Burnt and		
Powd.		
Talc, French		
Talc, American		
Terra Alba, Fr'ch. 100 lb		
Terra Alba, English		
Terra Alba, American No. 1		
Terra Alba, American No. 2		
Umber, Turkey, Burnt and		
Powd.		
Umber, Turkey Bnt. Ln.		
Umber, Turkey, Raw and		
Powd.		
Umber, Turkey, R/w Lumps		
Umber, Turkey, Bnt. Amer.		
Umber, Turkey, R/w Amer.		
Yellow, Chrome		
Vermillion, American Lead		
Vermillion, Quicks'g, bulk		
Vermillion, Quicks'g, bags		
Vermillion, Quicksilver sm'r		
Vermillion, English Import		
Vermillion, Imitation, Eng.		
Vermillion, Trieste		
Vermillion, Chinese		
Whiting Common, 100 lb		
Whiting Gilders		

Zinc, American, dry		
Zinc, French, Red Seal		
Zinc, French, Green Seal		
Zinc, French, V. M. X.		
Zinc, Antwerp, Red Seal		
Zinc, Antwerp, Green Seal		
Zinc, German, L. Z. O.		
Zinc, V. M. in Poppy Oil, G.		
Seal, lots of 1 ton and over		
lots less than one ton		
Zinc, V. M. in Poppy Oil, Red Seal		
lots of 1 ton and over		
lots less than 1 ton		
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%. No discount allowed on less than bbl. lots.		

Colors in Oil—

Black, Drop, Frankfort		
Black, Drop, English		
Black, Drop, Domestic		
Black, Lampblack, Best		
Black, Lampblack, Common		
Black, Ivory		
Blue, Chinese		
Blue, Prussian		
Blue, Ultramarine		
Brown, Vandyke		
Green, Chrome		
Green, Paris		
Sienna, Raw		
Sienna, Burnt		
Umber, Raw		
Umber, Burnt		

Putty—

In barrels and 1/2 bbls.		
In tubs		
In tin cans		
In bladders		

Spirits Turpentine—

In regular bbls.		
In machine bbls.		

Glue—

Low Grade		
Cabinet		
Medium White		
Extra White		
French		
English		
Irish		

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